

DIRECT CARD PRINTER

PR5300

Service Manual



Ver. 1.0

Jun.'99

Section 1 Overview

1. 1 Outline of Equipmemt

1.1.1 Description of Equipment

This equipment is a full color card printer to print image, characters and protective overlay on a plastic card based on the data supplied from personal computer.

Printing method is dye sublimation heat transfer printing for color image and heat melted ink transfer printing system for characters (black) and protective overlay. With standard built in Flip Turn Block, both side printing is possible in single operation. In addition to the normal plastic cards, thinner cards such as prepaid telephone card can be printed directly by adjusting the height of card entrance of supply unit. In this case gaps of the card transport rollers must be adjusted as factory setting.

Magnetic encoding is possible on the magnetic stripe of the card by connecting Magnetic Encoding Unit which is available as an optional unit. Also, as an option, Heat Roller Unit is available for printing hologram coating and thicker protective overlay.

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Section 1 Overview

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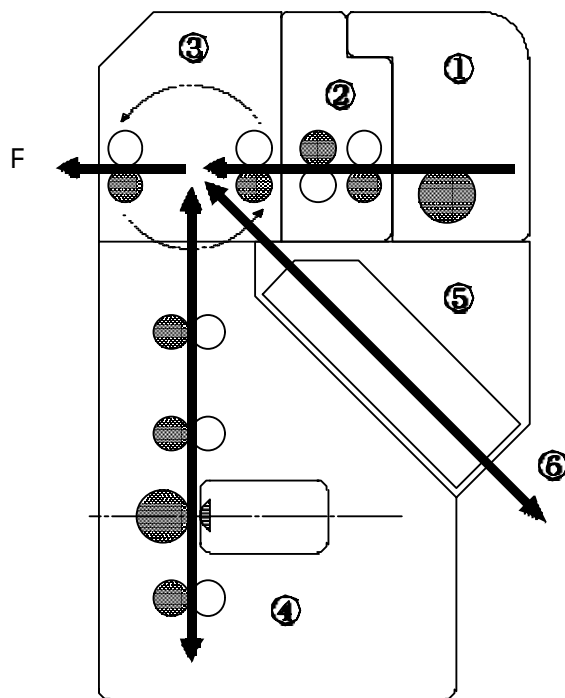
Magnetic encoding is possible on the magnetic stripe of the card by connecting Magnetic Encoding Unit which is available as an optional unit. Also, as an option, Heat Roller Unit is available for printing hologram coating and thicker protective overlay.

1.1.2 Basic Specifications

Printing method	Image Area: Dye Diffusion Thermal Transfer Character Area: Molten Type Thermal Transfer Protective Layer: Molten Type Thermal Transfer
Printing Media	PVC Card (<i>Recommended Card by NISCA</i>) Size:Conform to JIS X 6301 (ISO standard CR-80) Thickness:Conform to JIS X 6301 (ISO standard CR-80)
Printing Resolution	300dpi (11.81dots/mm)
Printing Grayscale	Input:256 grayscale for each colors R,G and B Output:256 grayscale control for each colors C,M and Y
Printing Size	Max. 85.5mm (card longitudinal) 54mm~ card transverse direction)
Printing Arrangement Area	Max. Entire area
Printing Speed	45seconds per card excluding communication time at the whole area printed as mentioned above.
Supply method and capacity	100 cards (card thickness:0.76mm);supplied automatically
Interface	SCSI or Parallel (Fixed in factory)
Power supply	AC 100 ~ 240V 50/60Hz
Power consumption	120W max.
Equipment dimensions	421mm(H) 271mm~ W 381mm D ~ () (excluding Stack Box)
Equipment weight	13kg:Main body 13.8kg:Including optional magnetic encoder

1.2 Mechanical Operation

This equipment consists of Card Supply Block, Flip Turn Block, Card Ejection Block, Card Encoding Block and Card Rejection Block.



@ Card Supply Block

Card Supply Box can contain up to 100 pcs of standard plastic cards (0.76mm thick) so that a continuous printing of high volume card is possible. The box is made of a transparent plastic for easy checking of the remaining card supply and protecting the cards from dust. The card is fed from the bottom of the pile and automatically transported in the printer. A weight plate is provided to ensure the positive feeding of cards when the remaining cards becomes low. Card separation is done by the gate at the entrance, which can be adjusted to various thickness of cards.

A Card Cleaning Block

There are two rubber rollers with sticky surface to remove dust. One is for front side of a card and the other is for back side of the card. Since this printer has this feature it is possible to make printing process faster and clear at dual side printing. It is necessary to clean them periodically to let them keep this performance. See section 4 for how to clean them.

B Flip Turn Block

It turns the card for both side printing. This block also serves to switch the card path to Print Block, Eject Block and Reject Block. It is possible to rotate this block manually. Never touch the part besides green color part when you need to rotate this block manually.

C Print Block

The card moves back and forth in the Print Block 5 times to be printed with 3 colors, black and overlay. Print Block consists of Card Transport Module, Print

Head Module and Ribbon Feed Module.

In the Card Transport Module, the card is transported by two pairs of capstan rollers placed in front and behind platen roller. While printing, the nip release mechanism works to eliminate the shock of the card entering the printing block and provide a smooth and clear printing.

Each roller is precisely driven by stepping motor to minimize the color deviation and the side of the card is controlled to limit skew.

A high resolution (300 dpi) thermal head is used in the Print Head Module for clear and high quality image printing. An even pressure (Approx. 2.0 Kg) is given to the thermal print head by two coil springs located at both ends of the head to maintain uniform contact to the card. The thermal head is assembled in one independent unit so that replacement is made very easy.

Also a user can replace the print head and ribbon at front side by featuring front access system.

Ribbon Feed Module has Feed Bobbin, Transport Roller, Take-up Bobbin and driven by each independent torque limiter so that the ribbon can be fed with constant tension for stable printing. Take up bobbin is driven at two speeds, slow for printing and high for non-printing, which makes the efficient operation possible.

D Card Encode Block

Magnetic Encode Unit, IC Encode Unit, etc are available for this printer as optional unit. By mounting the Encode Unit, printing of image and characters, encoding magnetic (or IC) data can be processed in one operation in one equipment. As the Encode Unit can be mounted in the Printer, it does not require additional desk space.

E Card Reject Block

If a trouble occurs while printing, the printer stops automatically. In such case, by pressing "Clear" key, the card currently being printed will be ejected through Reject Exit.

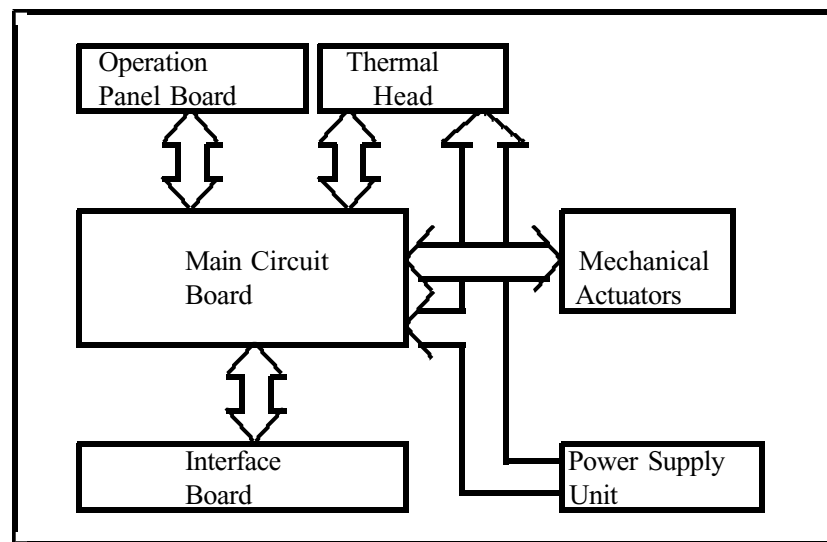
F Card Ejection Block

Card Ejection Block has a transparent card stack box. The printed cards are ejected in this box and stacked (100 cards of standard thickness).

The box has a cut out for easy removal of the printed cards.

1.3 Electrical operation

1.3.1. Electrical Block Diagram



Printer Unit Block Diagram

The Printer Unit is controlled and driven with the following components.

Main Circuit Board PBA-MAIN ()
Receives commands and data from the host through SCSI interface and controls the operation of the Printer Unit, also controls the thermal print head according to the image data.

Interface Board PBA-I/F- SCSI or PBA-IFP ()
Controls the SCSI or PARALLEL interface.
For SCSI : It has connector and terminator switch for SCSI interface and has connector for optional units.
For PARALLEL : It has a connector for IEEE1284 interface and has connector for optional units

Operation Panel Board PBA-OPEPANE ()
Constituted with LCD, LEDs, Push Buttons, and controlled by the Main Circuit Board.

Power Supply Unit
Supplies DC24V, DC16V and DC5V to the Printer Unit and Optional Unit.

Thermal Head
Supplies head energy for printing the image, characters and OP (over coat).

Mechanical Actuators
Consists of sensors and the motors to transport the cards.

1.3.2 Main Circuit Board (PBA-MAIN)

There are CPU Block, Memory Block, Actuator Control Block.

<CPU Block >

CPU Block has the following functions:

- o Control the interface with the host computer.
- o Transmit data and commands to Image Memory Block, Image Correction Block, and Thermal Head Control Block.
- o Controls the Mechanical Actuators..
- o Transmit data and commands to the Optional Units. (Serial communication)
- o Control the user interface with the Operation Panel Board.

Following items are the main components:

32 bit CPU IC1 ()

32 bit single chip micro processor, activated on the clock of 12.5 MHz (OCS1)

Flash Memory IC5 ()

A memory of 2 M bytes for storing the firmware of CPU(IC1) and data for thermal head.

It can be downloaded through the SCSI interface.

SRAM IC3,4 ()

256K byte memory to be used by CPU(IC1) to store the data.

Serial EEPROM IC8 ()

2K byte memory to record total frame number, number of errors, setting values of the specific unit, etc.

Serial interface driver IC33 ()

Translated the signal of CPU to RS232C for communication with the built-in encoder unit.

DRAM IC11 ()

Memory of 8 M byte which stores the data of RGB +characters for 2 frames.

Control IC IC12 ()

A Gate array to control the printer activated on the clock of 20MHz.

This IC controls following items by setting from CPU

- > To control the transfer of the image data to DRAM (IC16, IC17) and also image rotating function.
- > To control the thermal head
- > Interface for SCSI or PARALLEL control IC
- > To control the LCD
- > Reset control: Watch dog timer
- > To supply driving signals for PM 1-3
- > To generate the control signal for DM1
- > To control sensors
- > To control the version of circuit boards and gate array

<Mechanical Actuator Control Block>

Actuates sensors and motors which are controlled by CPU (IC1).

Sensor SN15 (adjustment) circuit

Transform the analog output voltage of the CPU (IC1) into energizing current of the LED. It consists of comparator (IC29) which converts the output signal of the photo transistor proportional to the energizing current.

SensorInput Circuit

This is a circuit consisting of an integrating circuit with resistors and capacitors, and inverters (IC 21, 22, 26, 27).

DM1 Driving Circuit

Transistor (Q10,17,18,19) drives the DM1 and breaking circuit is activated when DM1 stops.

PM1 Driving Circuit

Unipolar, constant current chopper type driver (IC24) drives. Driving signal is supplied by control IC (IC2).

PM2 Driving Circuit

Unipolar, constant current chopper type driver (IC17) drives. Driving signal is supplied by control IC (IC2).

PM3 Driving Circuit

Unipolar, constant current chopper type driver (IC18) drives. Driving signal is supplied by control IC (IC2).

HFAN Driving Circuit

HFAN is driven by transistor array (IC30). Fan motors have built-in abnormality detector circuit, which controls the driving current and transmit alarm signal when abnormal rotation is detected.

DFAN Driving Circuit

DFAN is driven directly by the current supplied from Power Supply Unit.

1.3.3 Interface Board (PBA-I/F)

Interface board applies to SCSI-2 or IEEE1284 standard.

<SCSI type interface board>

There are two "half 50" pin connectors on the interface board. Also, there is a connector for connecting the optional device.

Serial interface driver IC36 ()

Translates the signal of CPU to RS422 level for the communication with the attached optional equipment.

SCSI Controller IC2 ()

Operates on the clock frequency (OSC1) of 20MHz and controls SCSI bus.

SCSI terminator IC3 ()

An active terminator IC supporting the SCSI specification which terminates the SCSI bus by the input of the switch (SW2) located on the backside of the printer.

<PARALLEL type interface board>

There is "half 36" pin connectors on the interface board. Also, there is a connector for connecting the optional device.

Serial interface driver IC36 ()

Translates the signal of CPU to RS422 level for the communication with the attached optional equipment.

IEEE1284 controller IC1 ()

Controls the interface between IEEE1284 bus and Control IC (IC2) located on main board and activated with 20 MHz clock (generated by OSC1)

PROM for Control IC

To store the program data for control IC.
This device is fit into a socket.

IEEE1284 Driver IC

To drive and receive the signals with peripheral equipment.
Applied to IEEE standard

1.3.4 Operation Panel Board (PBA-OPEPANE)

Operation Panel is used to indicate the current situation of the Printer to the operator, to change setting, execute printing, and clearing errors.

LCD IC1 ()

LCD panel of 16 characters * 2 lines. Displays the condition of the printer, setting and changes of values, error messages, etc.

LED1 - LED3

Indicate the Printer condition to operator.

SW1 - SW3

Switches for operator to operate the Printer.

Note: Details of operating the Operation Panel is explained in Section 3,
Operation Panel.

1.3.5 Mechanical Actuators

The Printer Mechanism consists of Sensors and Motors, etc.

<Input mechanisms>

Symbol	Component	Function
SN1	Optical Sensor (Single unit)	Detection of card empty at Card Supply Block.
SN2	Optical Sensor (Single unit)	Detection of card position (Just before Cleaning Roller)
SN3	Optical Sensor (Single unit)	Detection of card position (Just before Flip Turn Unit)
SN4	Optical Sensor (Single unit)	Detection of card position (Just before Print Block)
SN5	Optical Sensor (Single unit)	Detection of card position (to detect the leading edge of a card)
SN6	Optical Sensor (Single unit)	Detection of the home position of Flip Turn unit.
SN7	Optical Sensor (Single unit)	Detection of the angle of Flip Turn unit.
SN8	Optical Sensor (Single unit)	Detection of length of ribbon fed.
SN10	Optical Sensor (Single unit)	Detection of mark on the ribbon.
SN11	Optical Sensor (Single unit)	Detection of printhead position.
SN12	Optical Sensor (Single unit)	Detection of printhead position.
SN13	Microswitch	Detection of open/close of Front Cover. (with interlock function)
SN14	Microswitch	Detection of open/close of Top Cover. (with interlock function)
SN15	Optical Sensor (Single unit)	Detection of card position (just before encoder) only available when Encoder set.

<Output Mechanisms>

Symbol	Component	Function
DM1	DC Motor	Rolls up Ink Ribbon. Moves (up/down) Thermal Head
PM1	Pulse Motor	Drives rotation mechanism in Flip Turn Block. Transports a card (Card Supply Block)
PM2	Pulse Motor	Transports a card (Flip Turn Block)
PM3	Pulse Motor	Transports a card (Print Block)
HFAN	Fan Motor	Cools Thermal Head.
DFAN	Fan Motor	Cools Power Supply.

Section 2 Setting Up

2.1 Setting Up

2.1.1 Caution for setting up

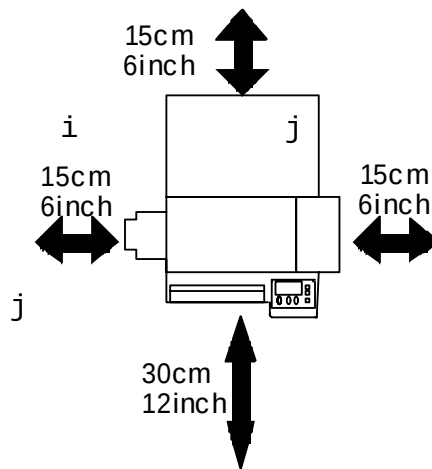
Dusty place must be avoided for using this equipment because the printing system of this printer is especially sensitive to dust. When printing on the card with magnetic stripe, do not place the printer at near the equipment which is emitting magnetic field. Other than above, use general caution for setting up other OAEquipments and choose proper place with proper environment. For further details, please read operation manual.

2.1.2 Space for installation

The space for the operation as shown in the illustration should be provided.

At least 50 cm 20 inch of clearance should be kept for the Top Cover.

Table to place the printer should be able to hold minimum 14Kg 31lb and have flat top and 4 rigid legs. It should not incline more than 1°.



2.1.3 Connection to Host Computer with SCSI or PARALLEL

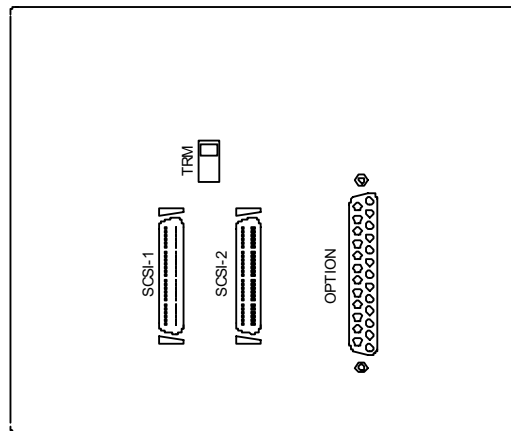
<SCSI type interface>

1) Connection of SCSI Cable

Connect the Printer, PC and Peripheral Units with SCSI Cable.

The Printer is equipped with two female connectors of 50 Pins (half type) of SCSI specification. Use suitable SCSI cable with suitable connectors to match the PC and Peripheral Units.

- Note 1: Total length of the SCSI cable should be within 6 meters.
To ensure stable operation, within 4 metres is recommended.
- Note 2: Please use the SCSI - II specification high impedance cable. In case of daisy chain connection, operation may become unstable unless all cables are SCSI-II specification.
- Note 3: Turn OFF power switches of the Printer, PC and all units when connecting the cable. The retaining hook should be securely latched.
- Note 4: On the backside of the Printer, OPTION CONNECTOR located next to SCSI connectors is the connector for the Optional Units of this card printer only.
Do not connect any other unit. It may cause a trouble.

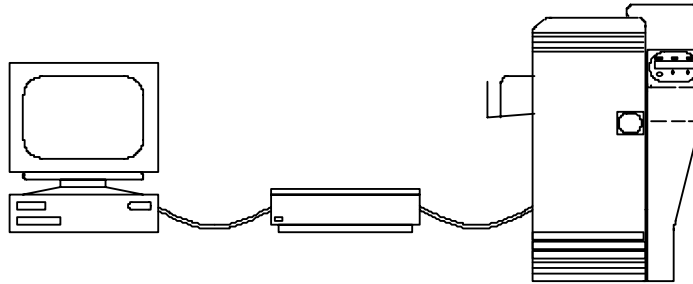


Interface connectors

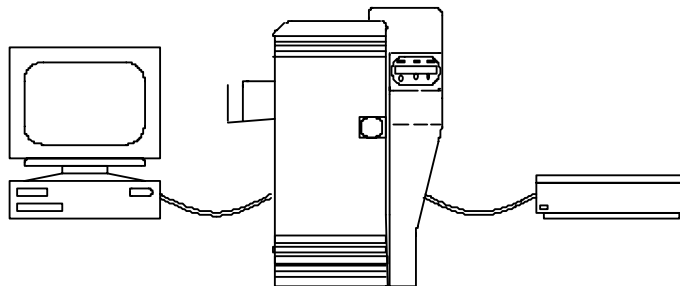
2) Setting internal SCSI Terminator.

The Printer has Active Terminator for SCSI-I and SCSI-II.

When using the Terminator, turn the switch at the back of the Printer ON (upper side).
(Turn OFF the power switch when operating this.)



To switch on



To switch off



Appearance of Terminator switch

3) Setting SCSI ID Number

The SCSI ID number can be freely selected from 0 to 7 through the operation panel of the printer.

Default ID setting is 4.

Note 1: Do not set the same ID number as the PC and other peripheral units. (It may cause a trouble.)

When setting, check the ID numbers of the other units.

Note 2: When setting the ID number, turn OFF the power switches of PC and all other peripherals.

<PARALLEL type interface>

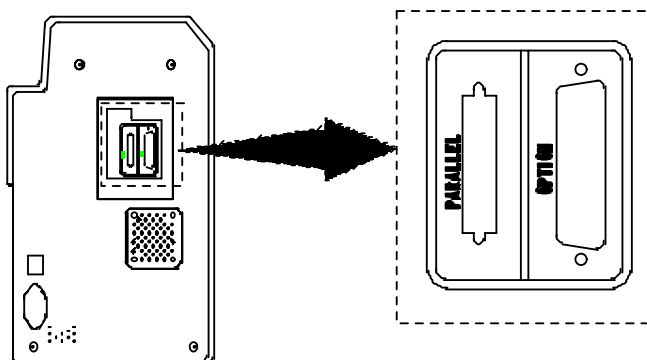
1) Connection ofIEEE1284 Cable

Connect the Printer, PC and Peripheral Units with IEEE1284 Cable.

The Printer is equipped with female connectors of Amphenol 36 Pins (half type)of IEEE1284 standard. Use suitablecablewithsuitable connectors to match the PC and Peripheral Units.

Note 3: Turn OFF power switches of the Printer, PCand all units when connecting the cable. The retaining hook should be securely latched.

Note 4: On the backside of the Printer, OPTION CONNECTOR located next to IEEE 1284 connectors is the connector for the Optional Units of this card printer only. Do not connect any other unit. It may cause a trouble.



2.2 Installation of the Encoder Unit

2.2.1 Installing steps

- Step 1 Turn OFF the printer power source.
- Step 2 Remove RIGHT-COVER. (Remove 2 x M-4 screws)
- Step 3 Take the screw off to take out a slide for a card rejected .
- Step 4 Insert the ENCODER into the encoder space of the printer with connecting the two harnesses from the printer.
- Step 5 Fix the ENCODER with the screw of which was removed in Step 3.
- Step 6 Put the small Exit Cover on the RIGHT-COVER with two screws.
The Exit Cover and two screws are supplied with ENCODER.
- Step 7 Put the RIGHT-COVER back to the printer and fix with 2 x M-4 screws



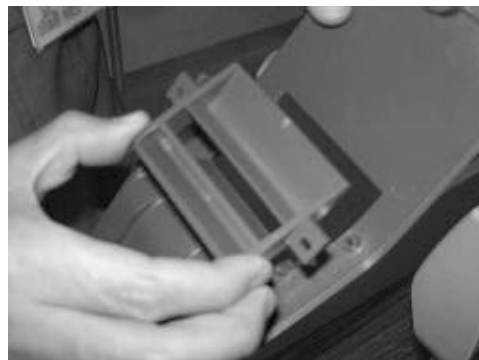
Step 3



Step 4



Step 5



Step 6

Section 3 Operation Panel

3.1 Overview

Operation panel of PR5300 is used as a communication interface with the operator. The Operation Panel has functions to display the printer setting such as image memory mode, ink ribbon selection etc and to check the condition of the printer operation such as finding the cause of error for trouble shooting, Printer adjustment, checking condition of operation etc as well as to show the current operating status of the printer.

3.2 Description of Operation Panel

Refer to Section 4 of the Operation Manual of PR5300.

3.3 Internal Modes of Printer

There are three Operation Panel Modes for PR5300 as following

1. Normal mode Display the current operating status, such as error, of the Printer during the print operation. The Printer is in this mode when the power is turned ON. Refer to Section 4-b of Operation Manual of PR5100 for the actual operation.
2. User mode This mode is used to set the Printer conditions such as setting of image memory, ink ribbon selection etc. Also, used to show the information such as the ROM version etc. For the operation refer to Section 4-b of the Operation Manual. In this section of this booklet, print mode only is explained. (3.3.4)
3. Service mode Adjustment of the Printer, such as the print density etc, is done in this mode. Also, this mode is used for analyzing the cause of trouble such as checking the condition of sensors and operation of individual actuators. Details of this mode is described in this section.

3.3.1 OPERATION OF SERVICE MODE

Service mode is the mode for the service person to adjust and check performance of the printer. The image data in the printer is cleared when switched to and from the service mode.

Switching to Service Mode

To switch to service mode,

1. Return from the other mode to Normal Mode.
2. In the idle or error mode, keep the MENU key pressed till it becomes Command Reception Mode. ("Input Command" appears on the LCD panel)
3. While pressing the MENU key, press EXE and CLEAR keys alternately (about 8 times) till the display changes from "Input Command" to "Service Mode".
4. Release the MENU key.

Moving in the Same Directory

To move in the directory, press MENU key to change the menu. MENU will change in the set order when the key is pressed.

Execution of a menu

See section 3.3.2 and 3.3.3 for operation of current menu.

Moving to the Lower Layer Directory

To enter into the directory of the lower layer from the present layer, press EXE key at the appropriate menu.

Returning to the Upper Layer Directory

To go one layer higher than the present, switch the menu to "Return to Parent Menu" and press EXE key.

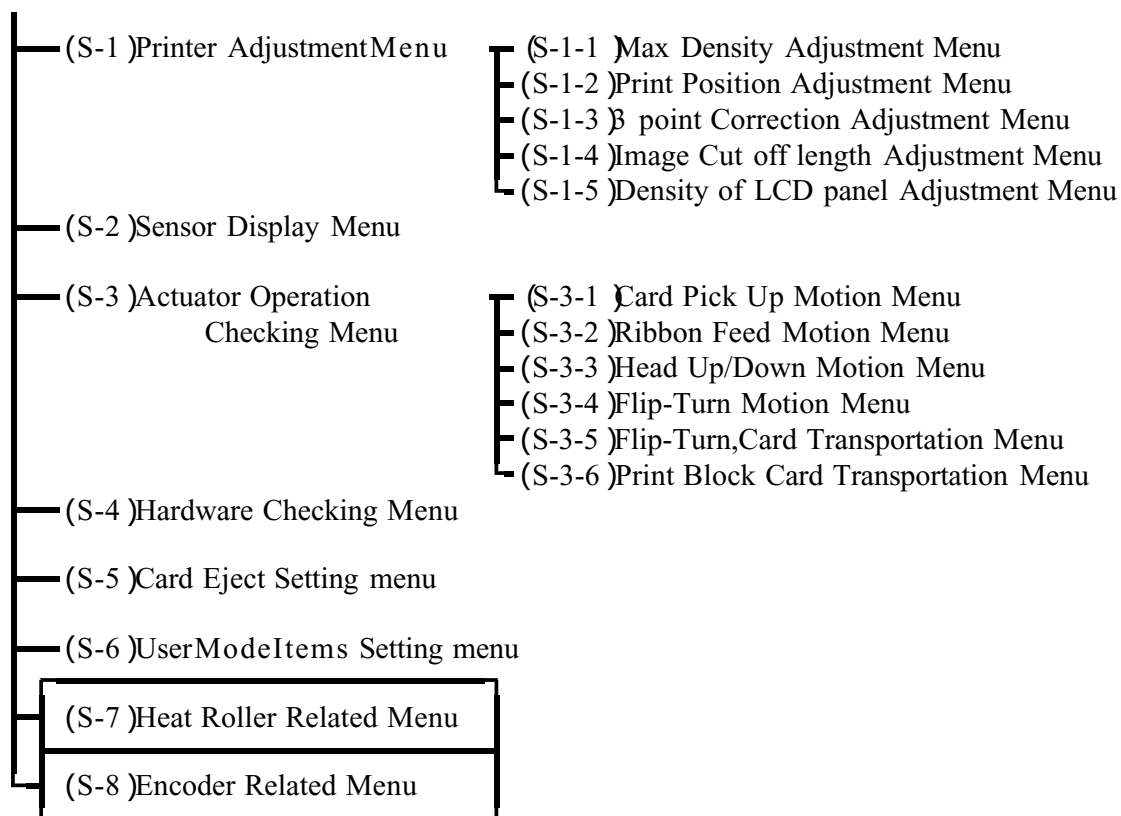
Returning to Normal Mode

Switch the menu to "Return to Normal Mode" and press EXE key or switch the menu to "Return to Parent Menu" and press CLEAR key.

3.3.2 Menu Structure of Service Mode

The Menus of Service Mode are as follows. The part in rectangle will be displayed only when the referred optional units are connected.

(S) Main Menu



(S)Main menu

MENU: Switching menu

'Adjustment Mode'	EXE: Switch to Printer AdjustmentMenu(S-1)
'Sensor Check'	EXE: Switch to Sensor Display Menu(S-2)
'Actuator Check'	EXE: Switch to Driving Motion Checking Menu(S-3)
'Hardware Check'	EXE: Switch to Memory Checking Menu (S-4)
'Eject Position'	EXE: Switch to Card Eject Setting menu (S-5)
'User Menu Config.Mode'	EXE: Switch to UserModeItems Setting menu (S-6).
'Encoder Check Mode'	EXE: Switch to Encoder Related Menu (S-7)
'Heat Roller Check'	EXE: Switch to Heat Roller Related Menu (S-8)
'Return to NormalMode'	EXE: Returns to NormalMode CLR: Returns to NormalMode

(S-1)Printer Adjustment Menu MENU: Switching Menu

'OD Adjustment'	EXE:Switch to Max Density Adjustment Menu(S-1-1)
'Position Adjustment'	EXE:Switch to Print Position Adjustment Menu (S-1-2)
'Uniformity Adjustment'	EXE:Switch to 3 points Correction AdjustmentMenu (S-1-3)
'Expanded Dt Adj EXE:sub menu	EXE:Switch to Image Cut Off Length Adjustment Menu (S-1-4)
LCD Adjustment EXE:sub menu	EXE:Switch to density of LCD adjustment Menu (S-1-5)
'Return to ParentMenu'	EXE: Returns to Main Menu (S) CLR: Returns to NormalMode

(S-2)Sensor Display Menu MENU: Switching Menu

SN 01 02 03 04 05 * * * * *	Display output of Sensor 01,02,03,04,05, (1:ON,2:OFF)
SN 06 07 08 10 * * * *	Display output of Sensor 06,07,08,10(1:ON,2:OFF)
SN 11 12 13 14 15 * * * * *	Display output of Sensor 11,12,13,14,15 (1:ON,2:OFF)
Auto Adjustment EXE:-----	EXE: Automatic Adjustment of Sensor 11
Return to Parent Menu	EXE: Returns to Main Menu(S) CLR: Returns to NormalMode

(S-3) Actuator Checking Menu MENU: Switching Menu

'Pickup MTR. (DM1) EXE: Sub menu	EXE: Switch to the operation menu of the Card TransportMotorinCardFeeder (S-3-1)
'Ribbon MTR. (DM2) EXE: Sub menu	EXE: Switch to the operation menu of the Ribbon Take up Motor in PrintModule(S-3-2)
'Headup MTR. (DM3) EXE: Sub menu	EXE: Switch to the operation menu of Head up/down motor in the Print Module(S-3-3)
'F.Turn Ang. (PM1) EXE: Sub menu	EXE: Switch to the operation menu of Flip Turn Module Rotation motor. (S-3-4)
'F.Turn Trf. (PM2) EXE: Sub menu	EXE: Switch to the operation menu of Card Transport Motor in the Flip Turn Module (S-3-5)
'Print Trf. (PM3) EXE: Sub menu	EXE: Switch to the operation menu of Card Transport Motor in the Print Module. (S-3-6)
'Return to ParentMenu'	EXE: Returns to Main Menu (S) CLR: Returns to NormalMode

(S-4)Hardware Checking Menu MENU: Switching Menu

'Address Check'	EXE: Switch to Address Checking Menu (S-4-1)
'Data Check'	EXE: Switch to Data Checking Menu(S-4-2)
'Return to ParentMenu'	EXE: Returns to Main Menu(S) CLR: Returns to NormalMode

(S-5) Card Ejection Setting Menu MENU: Switching the menu

'Stuck Position' *****	EXE: Designates the place of ejection of the normally finished card.
'Reject Position' *****	EXE: Designates the place of ejection of the card finished in error
'Select Action' *****	EXE: Designates the action pattern of card transportation
'Print Number ' *****	Designates the Number of card transportation action EXE: Increment of value CLR:Decrement of value
'Card Pass Test' EXE: Start	EXE: Executes the card transportation.
'Return to ParentMenu'	EXE: Returns to the Main menu (S). CLR: Returns to the Normal mode.

(S-6) User Mode Items Setting Menu MENU: Switching the menu

Ribbon Menu Disp (on/off)	EXE: Permit/Prohibit of "Ribbon Type" in the User Mode.
AdjustMenuDisp (on/off)	EXE: Permit/Prohibit of "Color Adjustment" in the UserMode.
Status Menu Disp (on/off)	EXE: Permit/Prohibit of "Printer Status" in the Use Mode.
Return to Parent Menu	EXE: Returns to the Main Menu (S). CLR: Returns to the Normal Mode.

(S-7)Encoder Related Menu Menu: Switching Menu

'***** Test' (****) EXE:Start	EXE: Writes encode data on the displayed track.
'Return to Parent' Menu	EXE: Returns to Main Menu(S) CLR: Returns to NormalMode

(S-8)Heat Roller Related Menu MENU: Switching Menu

'Heat Total Time' *****	Displays the total on time of the heater
' Position Adj. ' ***	EXE: Increment of value CLR: Decrement of value
'Heat Roller Test' EXE:Print	EXE: Printing Test Pattern CLR: Clearing Errors
' Sensor Adj ' EXE:Start	EXE:Adjustthesensivity for ribbon position sensor in Heat Roller
'Return to Parent' Menu	EXE: Returns to Main Menu(S) CLR: Returns to NormalMode

(S-1-1)Max Density Adjustment Menu MENU: Switching Menu

'ODAdj.Color'	EXE: Increment of value CLR: Decrement of value
'Zero Adj. Color'	EXE: Increment of value CLR: Decrement of value
'ODAdj.Black'	EXE: Increment of value CLR: Decrement of value
'Zero Adj. Black'	EXE: Increment of value CLR: Decrement of value
'ODAdj.Clear'	EXE: Increment of value CLR: Decrement of value
'Zero Adj. Clear'	EXE: Increment of value CLR: Decrement of value
'Color Adjustment' Test Print	EXE: Print Test Pattern J CLR: To Release the error
'Black Adjustment' Test Print	EXE: Print Test Pattern E CLR: To Release the error
'Return to ParentMenu'	EXE: Returns to Printer Adjustment Menu(S-1) CLR: Returns to NormalMode

(S-1-2)Print Position Adjustment Menu MENU: Switching Menu

' Horizontal Adj.'	EXE: Increment of value CLR: Decrement of value
' Vertical Adj.'	EXE: Increment of value CLR: Decrement of value
'Black Shift Adj.'	EXE: Increment of value CLR: Decrement of value
'Position Adj EXE:Test Print'	EXE: To Print Test Pattern H CLR: To Release the error
'Black Shift Adj.' EXE:Test Print'	EXE: To Print Test Pattern M CLR: To Release the error
'Return to ParentMenu'	EXE: Returns to Printer Adjustment Menu(S-1) CLR: Returns to NormalMode

(S-1-3) Point Correction Adjustment Menu MENU: Switching Menu

'Uniformity Adj.' Lower	EXE: Increment of value CLR: Decrement of value
'Uniformity Adj.' Center	EXE: Increment of value CLR: Decrement of value
'Uniformity Adj.' Upper	EXE: Increment of value CLR: Decrement of value
'Color Uniformity' Test Print	EXE: Print Test Pattern H CLR: To Release the error
'Black Uniformity' Test Print	EXE: Print Test Pattern E CLR: To Release the error
'Return to ParentMenu'	EXE: Returns to Printer Adjustment Menu(S-1) CLR: Returns to NormalMode

(S-1-4) Image Cut Off Length Adjustment MENU:Switching Menu

'Data Cut Enable (On/Off)'	EXE: Settheimagecuttingoff function enable or disable for the image which out of printing area.
'Return to ParentMenu'	EXE: Returns to Printer Adjustment Menu(S-1) CLR: Returns to NormalMode

(S-1-5) Density of LCDAdjustment Menu MENU:Switching Menu

LCD Adjustment ****	EXE: Inclement of value CLR: Declement of value
'Return to ParentMenu'	EXE: Returns to Printer Adjustment Menu(S-1) CLR: Returns to NormalMode

(S-3-1) Operation Menu of the Card Transport Motor in the Card Feeder

MENU: Switching the menu

Pickup MTR (PM1) EXE: Start	EXE: To pick up a card
Return to Parent Menu	EXE: Returns to Actuator Checking Menu CLR: Returns to NormalMode

(S-3-2) Operation Menu of the Ribbon Take Up Motor in the PrintModule

MENU: Switching the menu

Ribbon MTR (DM1) EXE: Roll Up	EXE: Takes up the ribbon.
Return to Parent Menu	EXE: Returns to Actuator Checking Menu CLR: Returns to NormalMode

(S-3-3) Head Up/Down Motion Menu MENU: Switching Menu

Head up MTR (DM1) EXE: *****	EXE: To moves the head to next position.
Return to ParentMenu	EXE: Returns to Actuator checking Menu (S-3) CLR: Returns to NormalMode

(S-3-4) Operation menu of the Flip Turn unit Rotation Motor

MENU: Switching the menu

F.Turn Ang. (PM1) EXE: *****	EXE: To rotate the F.Turn module to next angle position
Return to ParentMenu	EXE: Returns to Actuator Checking Menu (S-3) CLR: Returns to the Normal Mode.

(S-3-5) Operation menu of the Card TransportMotorintheFlipTurnModule

MENU: Switching the menu

F. Turn Trf. (PM2) EXE: Start	EXE: To transport the card in Flip Turn Module.
Return to Parent Menu	EXE: Returns to Actuator Checking Menu (S-3) CLR: Returns to the Normal Mode.

(S-3-6) Operation menu of the Card TransportMotorinthePrintModule

MENU: Switching the menu

Print MTR EXE: Start	EXE: To transport the card in Print Block.
Print Trf. REV EXE: Start	EXE: Transports in the reverse direction.
Return to Parent Menu	EXE Returns to Actuator Checking Menu (S-3) CLR: Returns to the Normal Mode.

3.3.3 Description of Service Mode

i (S-1) Printer Adjustment Menu (Adjustment Mode)

This is the menu to adjust the printing conditions such as print position and print density etc. Mainly used when the Print Head is replaced.

If the error LED lights when printing test pattern, clear the error by removing the cause and pressing the CLEAR key. If the error can not be cleared, return to Normal Mode and confirm the nature of the error.

(S-1-1) Adjustment of the Maximum Density Menu (OD Adjustment)

Adjust the maximum density. The range of adjustment is -7 ~ +7 for color, resin black and protective layer.

Note: Do not increase the value unnecessarily. It may cause ribbon peel off (blotch) error.

OD Adj. Color
-7 -- +7

Adjust the energy to print color image. The higher the value, the deeper the color becomes.

Zero Adj. Color

In the color image printing, adjusts the energy for the preheating.

OD Adj. Black

Adjust the energy to print the heatmelting black. The higher the value, the higher the energy to print the heattransfer black.

Zero Adj. Black

In the heat transfer black printing, adjust the energy for the preheating. This affects the edge sharpness.

OD Adj. Clear

Adjust the energy to print protective layer. The higher the value, the higher the energy to print the protective layer.

Zero Adj. Clear

In the printing of protective layer, adjust the energy for the preheating. This affects the edge sharpness.

Color Adjustment
EXE:Test Print

To print the test pattern for checking the maximum density of color print and condition of protective layer.

Black Adjustment
EXE:Test Print

To print the test pattern for checking the condition of black print.

(S-1-2) Print Position Adjustment (Position Adjustment)

Adjust the printing position. The range of adjustment is +/-50 for horizontal direction and +/- 16 for vertical direction. The value is the number of dots for both horizontal and vertical direction.

Since the resolution of this printer is 300 dots per inch, the formula is as follows:

$$\text{Adjustment value of 1} = 1 \text{ dot} = 25.4\text{mm}/300 = 0.085\text{mm}.$$

Horizontal Adj. -50 ---- +50

Adjust the position in the horizontal direction.
Increment in value is to move the print position to the right.

Vertical Adj. -16 ---- +16

Adjust the position in the vertical direction.
Increment in value is to move the position downward.

Position Adj. EXE: Test Print

To print the test pattern for adjusting the print position.
Adjust the value for positioning the color image in center of the card.

<Black Shift Adjustment>

To correct the divergence of the print position between color printing and black printing when print the pattern of which beginning point of print is not same of the data for color and black each other.

Note : The divergence of print position depends on the printing pattern

Black shift Adj. -10 ---- +10

Adjust the distance of transporting the card not in printing process .
Increment in value is to move the beginning point of print of the

Black Shift Adj. EXE: Test Print

To print the test pattern for adjusting the print position.
Adjust the value for the black line is positioned in center of white line.

(S-1-3) 3 points Correction Adjustment (uniformity Adjustment)

Correct the unevenness of density in the horizontal direction.

Range of adjustment is -9 ~ 0 for upper, center and lower area. Increment in value is to higher density.

Uniformity Adj. Upper

Adjust the energy for upper area of the card.
Increment in value is higher density.

Uniformity Adj. Center

Adjust the energy for center area of the card.
Increment in value is for higher density.

Uniformity Adj. Lower

Adjust the energy for lower area of the card.
Increment in value is for higher density.

Black Shift Adj. EXE: Test Print

To print the test pattern for adjusting the uniformity of the density.
Adjust the value for the density of all 3 areas are same each other.

(S-1-4) Image data cutoff length Adjustment. (Expanded Data Adj.)

This cuts off the data which overflowed from the printing area.

If this setting is accepted, a part of the transmitted data may not be printed. (max 1mm)

The area of the data which is not printed varies by each card.

Data Cut Enable ON/OFF

Set the Data cut function ON or OFF

(S-1-5) Density of LCD panel Adjustment.

LCD Adjustment -3 ---- +3

Adjust the density of LCD panel
Increment of the value for higher density.

i (S-2) Sensor check Menu (Sensor Check Mode)

This is the menu to display the sensor outputs and automatic sensor adjustment. Used to check the condition of the printer when troubleshooting.

SN	01	02	03	04	05
	*	*	*	*	*

SN	06	07	08	10
	*	*	*	*

SN	11	12	13	14	15
	*	*	*	*	*

Displays the sensor output. The display is made according as the logic table of the sensors. The correspondence of the sensors is as following. The names correspond to the names used in the Electric Parts Layout.

SN1	Detection of card empty atCardSupplyBlock
SN2	Detection of card position (Justbefore Cleaning Roller).
SN3	Detection of card position (Justbefore Flip Turn Unit).
SN4	Detection of card position (Justbefore Print Block).
SN5	Detection of card position (to detect the leading edge of a card).
SN6	Detection of thehome position of Flip Turn unit.
SN7	Detection of theangleofFlipTurn unit.
SN8	Detection of length of ribbon fed.
SN10	Detection of mark on the ribbon.
SN11	Detection of print head position.
SN12	Detection of print head position.
SN13	Detection of open/close of Front Cover.(with interlock function)
SN14	Detection of open/close of Top Cover.(with interlock function)
SN15	Detection of card position(just before encoderonly available when Encoder set)

Auto	Adjustment
***	***

Shows difference between expected and actual output voltage. 1 = 0.02V .
Shows input voltage of the LED

The sensor 10 is automatically adjusted and the condition of the light emittanceand reception of the sensor is checked. In the display of the details menu of each sensor, the input voltage of the light emitting elementisshownonthe lowerleftsideandthe difference between the actual output voltage and the expected voltage of the receiving element on the lower right side.

Note: When adjusting the automatic adjustment, remove the object at the sensor. Otherwise, the automatic adjustment will not be made normally.

i (S-3) Actuator Check Menu (Actuator Check Mode)

Controls the independent operation of the printer actuators.
Used for checking the actuator operation in troubleshooting.

note: When checking the actuators, remove the remaining card from the printer beforehand. It may cause the Printer trouble.

S-3-1) Operation menu of the card pickup (Pickup MTR. PM1))

Drives the card pick up roller.
Starts by pressing EXE key and stops automatical after elapse of a set time.
To interrupt the operation, press CLR key.

Pickup MTR. (PM1)
EXE:*****

└─ Set the transportation speed
LDRV: Slow
HDRV: Fast

S-3-2) Operation menu of the Ribbon Take-up Motor (Ribbon MTR. DM1))

Drives the ribbon take-up motor. Starts by pressing EXE key and stops after elapse of a set time.
To interrupt the operation, press CLR key.

Ribbon MTR. (DM1)
EXE:*****

└─ Set the transportation speed
LDRV: Slow
HDRV: Fast

(S-3-3) Print Head Up/Down Menu (Headup MTR. DM1))

Independent motion of the Print Head. Head moves to the position set by pressing EXE key.
To interrupt the operation, press CLR key.

Headup MTR. (DM1)
EXE:*****

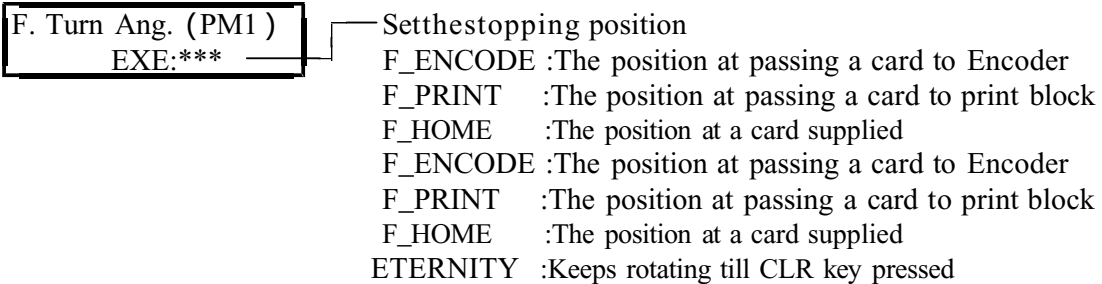
└─ Set the stop position
UP : Moves to ribbon replaceable position
Home : Moves to Home position
Down : Moves to Printing position

Note
Do not operate the transportation motor in print block when print head position is at DOWN
It may cause the print head damaged.

§3-4 Operation menu of the rotation motor of the Flip Turn Module (F.Turn Ang. (PM1))

Drives the rotation motor of the flip turn module by pressing EXE key and stops at the position set . There are two positions to each stopping position. One is normal and the other is reverse position as 180 degree against normal.

Display shows these positions as "F (forward)" and "R (Reverse)" for each menu.

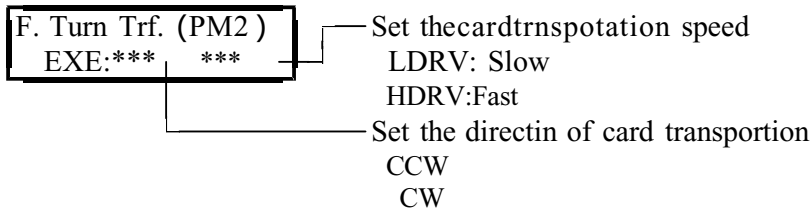


§3-5 Operation menu of the Card Transport Motor in the Flip Turn Module (F. Turn Trf. (PM2))

Drives the card transport motor in Flip Turn Module

Starts by pressing the EXE key and stops after elapse of a set time.

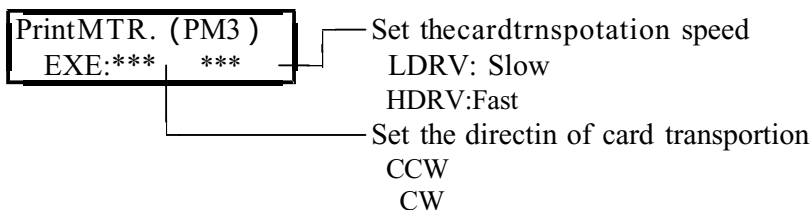
To interrupt the operation, press CLR key.



§3-6 Operation menu of the Card Transport Motor in the Print Module (Print Trf. (PM3))

Transports the card in the print module . There are 3 menus, normal, reverse and print transportation.

Starts by pressing the EXE key and stops after elapse of a set time.



i (S-4) Hardware Checking Menu

This menu is used to check whether there is trouble in image memory (frame memory). Possible to check separately the address bus and the data bus for image memory. Use this function when color skipping occurs or when the normal printing of the transmitted image becomes impossible.

Address Check EXE: Start	Check whether the connection of address bus is normal.
Data Check EXE: Start	Check whether the data transfer is normally done when reading /writing onto the frame memory. It takes several minutes to finish

(S-5) Card Ejection Setting Menu

This menu is used for setting the positions of card ejected/rejected.

'Stuck Position' *****	Designates the place of ejection of the normally finished card. Left (default): Ejection block Right : Rejection block
'Reject Position' *****	Designates the place of ejection of the card finished in error. Right (default) : Rejection block Left : Ejection block
'Select Action' *****	Designates the action pattern of card transportation Card Stack : Transport a card to exit where designated at "Stack Position" menu. Card Reject : Transport a card to exit where designated at "Reject Position" menu.
'Print Number ' *****	Designates the Number of card transportation action EXE: Increment of value CLR: Decrement of value
'Card Pass Test' EXE: Start	Executes the card transportation action which designated at 'Select Action' menu.

i (§-6) UserModeItems Setting Menu

This menu is used for setting the limitation on some items displayed in USER MODE.

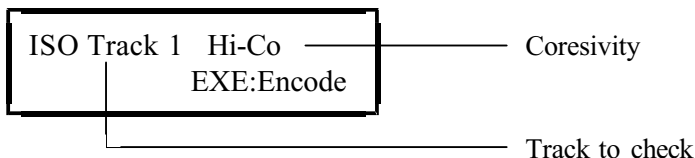
Ribbon Menu Disp (on/off)	Permit/Prohibit of "Ribbon Type" in the User Mode.
Adjust Menu Disp (on/off)	Permit/Prohibit of "Color Adjustment" in the User Mode.
Status Menu Disp (on/off)	Permit/Prohibit of "Printer Status" in the Use Mode.

i (§-7) Encoderrelated Menu

This is the menu to check operation of the optional Encoder. Mainly used for checking encode operation when trouble shooting.

Encode Operation Menu

This menu is for encoding. Different encode data is created in the Printer at each operation so that the erroneous recognition at verification will not occur when pre-encoded card is used.



Track Setting and Checking DATA

ISO Track1 : Encode on ISO Track 1 (76 Characters)

**ISO TRACK 1 ENCODE TEST. ARTLAND COLOR PRINTER PR5100 TOTAL
NO. = *******

ISO Track2 : Encode on ISO Track 2 (37 Characters)

123456789012345678901234567==*****

ISO Track3 : Encode on ISO Track 3 (104 Characters)

**123456789012345678901234567890123456789012345678901234567890123456789012345678901
45678901 2345678901234==*******

Coercivity HICO : Encode with high Coercivity (Hi-Co)
 LOCO : Encode with low Coercivity (Lo-Co)

If encoding is done normally, 'Data Write OK' is displayed in the second line.

Press CLEAR or EXE key.

If error occurs during operation, error LED turns ON and the nature of the error is displayed on the Operation Panel. Clear the error by pressing CLEAR key.

i (§-8) Heat Roller related menu

This is the menu for adjusting and checking operations which are related to Optional Heat Roller. Mainly used for checking Heat Roller operation when trouble shooting.

Menu to display total ON time of the heater Total Heat Time (

Displays the total ON time of the heater of the Optional Heat Roller.
The displayed unit is hour. The number changes when the power is turned ON.

Heat Total Time *****

Heat Roller Position Adjustment Menu Heat Position Adjustment (

This is used to adjust the printing position of sub scanning direction of the Heat Roller.
Range of adjustment is }35. The setting value is same as the resolution of the printer;
1 value = 1 dot = 25.4mm/300 =0.085mm.

Position Adj. -35 ~ 35

Adjustment of print position for sub scanning direction.
Increment of value is to move print position to the right.

Position Adj EXE:Test Print

Print the pattern to check the position of printing the ribbon
set in a Heat Roller unit.

Sensivity of a sensor in Heat Roller adjustment Menu Sensor Adjustment

SensorAdj. EXE: Start

To adjustthesensivity level of the sensorforleadingedge of
the each panel of the ribbon in Heat Roller.

Accordint to the result of the adjustment, message shown below
will beappeared on lower part of the LCD panel.

' COMPLETE *** ' : Finished normally. *** means the valu of D/A output
' DISABLE ' : There an object at the sensor. Rmove the object and retry.
' ERROR ' : An error has occured while adjuting . Go back to Main
Menu and recover .

3.3.4 Description of Printer Status

In the User Mode, Print Mode is for the menu to set the Printer operation. The setting items in this menu are mainly dependent on the application of the Printer. Follow the system operation manual for the setting.

Refer to Section 4-b and 4-c of the operation manual of PR5300 for the method of setting. Description of the setting of Print Mode is included in the returned information against the SCSI setting status request command. (Printer System Information) Refer to Section 3 - 6 of Command Specification of PR5300. There are following 6 kinds of setting items.

1. Memory Mode

This is for setting image memory of the Printer. The setting can be switched by the SCSI command. Refer to Section 4-17, Memory Mode Setting Commands, of the Command Specification of PR5200.

Ring.M Auto clr:	One side alternative receive, memory auto-clear permitted
Ring.M DataHold:	One side alternative receive, memory auto-clear prohibited
Ring.M DualSide:	Both side receive together, memory auto-clear prohibited
Single DataHold:	One side receive only, memory auto-clear prohibited
Economy Dualside:	One side receive together, memory auto-clear prohibited

Default setting is 'Ring.M Auto clr'.

2. SCSI ID Select

Sets the SCSI ID of the printer. After setting, please reset the printer.
Default is "4".

3. Parity Set

Use this for setting parity check function for SCSI communication.

OFF: No check parity.

ON: Check parity.

Default setting is 'OFF'.

4. Encode Type

Sets HICO/LOCO for writing the magnetic encoding. This is shown only when the encoder has the function of switching HICO/LOCO.

Default is "LOCO".

5. Encode First

Set the priority for encode operation or print operation.

This is shown only when the encoder unit is connected.

OFF: Print operation (and other operation with optional units) first.

ON: Encode operation first.

Default setting is 'OFF'.

6. Encode Mode

Set the card transport mode for encoding operation. Refer to Section 3-6 of Command Specification of PR5100 regarding the relation of each encoder type and the side of the card with magnetic stripe.

A (Back Side) : Encoding is done on the back of the image side.

B (Front Side) : Encoding is done on the same side as the image side.

Default setting is 'A (Back Side)'.

7. Exe Key Print

Set the functions of EXE key when the Printer is ready. Refer Section 4 of the Operation Manual of PR5100.

OFF: No function is assigned to EXE key when Printer is ready.

ON: Print function is assigned to EXE key when the Printer is ready.

Printing operation is done by the print information which is stored in the Printer.

Default setting is 'OFF'.

Note: In the memory modes other than "Ring.M Dual Side" and "Economy Dualside" and in the case of re-printing of the both side print data, the frame which has been received at the last time only will be printed. This is because there is no such idea as the data of front and back sides makes one frame when receiving the both side data in these modes.
For the other modes than the above, basically select the setting of "OFF".

8. Print Retry

This is to set the function to automatically reprint when an error occurs while printing.

OFF: Returns to ready condition after releasing error.

ON: After releasing error, prints again the print information stored in the Printer.

Note: In the memory modes other than "Ring. M Dualside" and "Economy Dualside" and when retrying the both side print data, only the frame which has become an error will be printed. This is because there is no such idea as the data of front and back sides makes one frame when receiving the both side data in these modes.
For the other modes than the above, basically select the setting of "OFF".

9. Parallel Print

When receiving the print command of more than 2 cards, the printing of 2 cards are processed in parallel. This function allows to shorten the processing time when printing the cards with plural processing such as magnetic encode, image printing, and heat roller, etc. Default is "OFF".

10. Card Eject Face

Designates the side of the card which ejected after printing.

Default setting : Card Face Up

Card Face Up	Eject the card with the side which is set as up in feeder block. On single side printing: Printing side up On dual side printing : First printing side up
Card Face Down	Eject the card with the side which is set as down in Feeder block. On single side printing: Printing side down On dual side printing : First printing side down
No Effect	Eject the card with the last printing side up On single side printing: Printing side up On dual side printing : Last printing side up

In case of the printing which includes flip-turn action more than twice, same as dual side printing mentioned above.

Set as 'No Effect' when need compatibility to PR5100 and/or P5200

10. Print Area

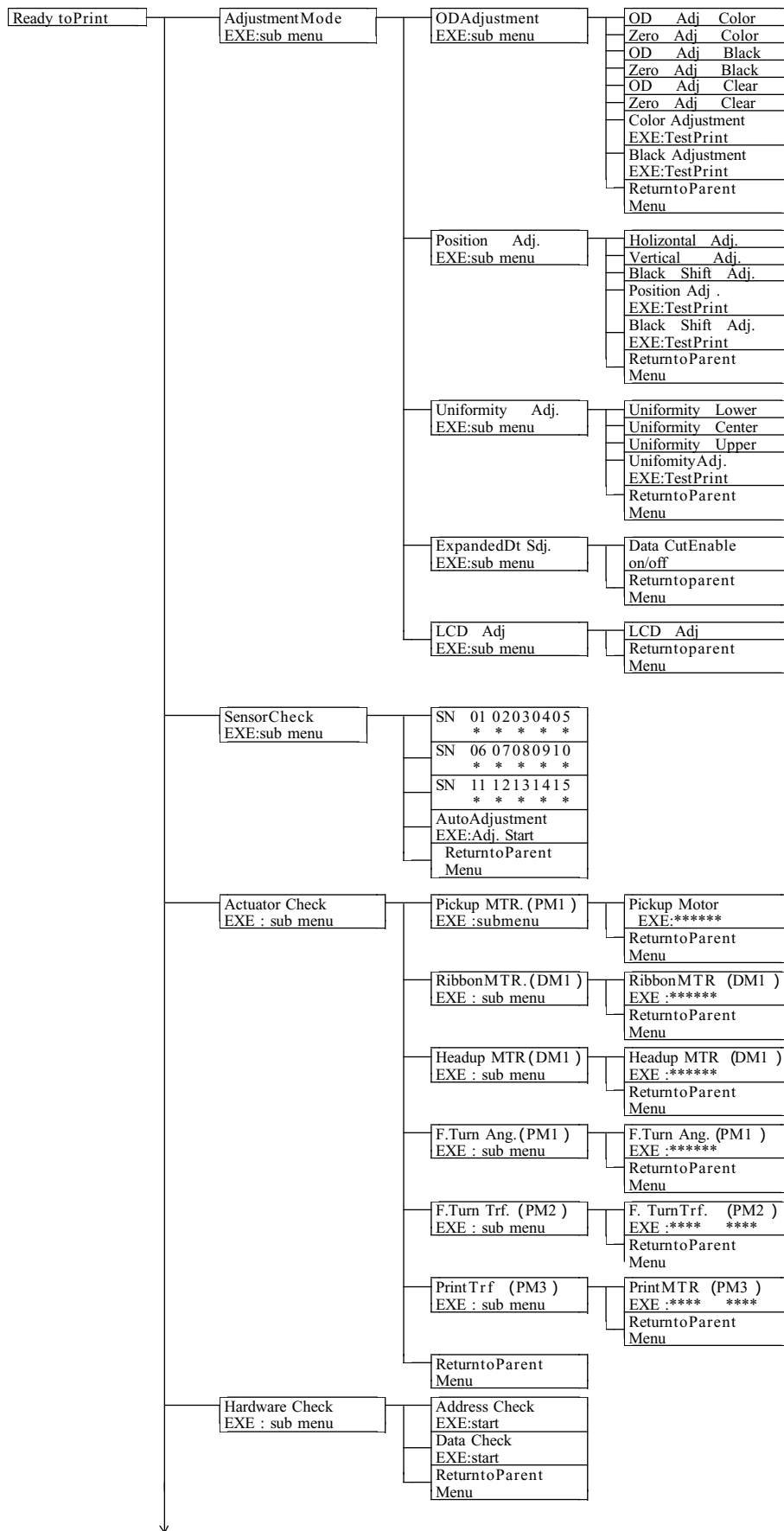
Set the maximum print area.

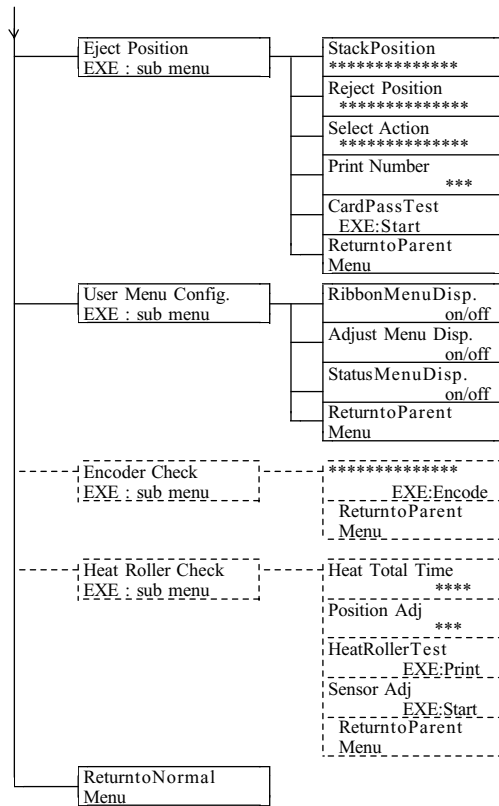
Default setting : Edge to Edge

Edge to Edge	Print on the whole area of the card
0.5mm Margin	Print on the entire area excluding 0.5mm non-printing area from all edges of the card.

It would happen not to print correctly on the edge(s) of a card caused by card itself such as curl, dull edge and so on.

3.4 Structure of Service Mode Menu





Section 4 Maintenance

4.1 Maintenance List

To keep the optimum performance of the Printer, periodic maintenance operation is necessary which is described in Section 6, Cleaning and Section 7, Periodic replacement Parts in the Operation Manual.

This section describes the items which may be required to perform considering the user's situation, as well as cleaning and replacements.

Section	Maintenance	Tools
Rubber Roller		
Cleaning Roller	Every 2,000 frames	Philips screw driver, Soft Cloth Alcohol
	Replace as required (40000 frames) Symptom: Poor transportation	Philips screw driver
Print Roller	Cleaning, every 10000 frames	Soft Cloth. Alcohol
Feed Roller	Cleaning, every 10000 frames	Soft Cloth. Alcohol
Other	Cleaning, as required Symptom: Poor transportation □ Trouble shoot	Philips screw driver, Swab Alcohol
Pulley Shaft	Apply Grease, as required Symptom: Noise	Flat-head screwdriver, Grease (Molycoat)
Head Holding Roller Shaft	Apply Grease, as required Symptom:	Flat-head screwdriver Grease (Molycoat)

4. 2 Method of Maintenance

In this section, the maintenance method is described for the items listed in the maintenance list. For the following items, read the relative sections of Operation Manual.

Cleaning	Cleaning Roller	Sec. 6
Replacing	Cleanig Roller	Sec. 7
Cleaning	Print Roller	Sec. 6
Cleaning	Feed Roller	Sec. 6
Cleaning	Print Head	Sec. 6
Replacing	Print Head	Sec. 7

4.2.1 Cleaning Rubber Roller

This printer has several sets of rubber rollers to ensure high reliability of card transportation. However, if the rollers are stained because of use of stained cards or cards coated with special materials, transport error may occur due to reduced transportation power. Though periodic cleaning of rollers may be performed by users with a certain level of experience, the following intensive cleaning should be done if such transportation error occurs.

@ Transport Rollers in Flip Turn Module

Open Top Cover and rotate Turn Module so that the rollers come to the position where the cleaning can be done easily.

- ▣ This operation is done with the green knob in the flip turn module.

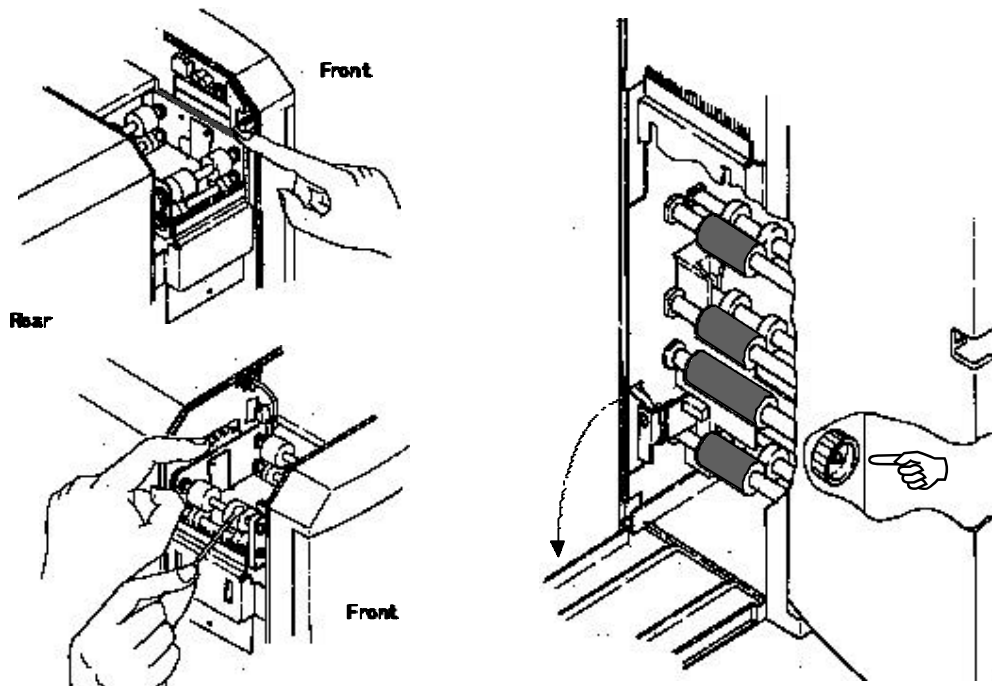
Press a soft cloth with alcohol to the rollers and rotate them.

- ▣ This operation is done by rotating Green handle located at inside of side plate.

A Transport Rollers

Open the left cover and insert a soft cloth with alcohol and press against rollers and rotate them.

- ▣ This operation is done with Cleaning Knob located on the Front Access Panel.



4.2.2 Applying grease to Pulley Shafts etc.

Plastic rollers used in this Printer is made of self-lubricative plastics.

On the shafts of rollers which are loaded with torque and has friction with shaft, grease is applied at the factory. Although further greasing is not required for normal usage, grease should be applied in case following parts are replaced for some reason or abnormal noise is detected.

Part No.	Name
PR5100P245	PUSH-ROLLER
PR5100P218	PLY S2M-22-60
PR5100P220	PLY S2M-16-70
PR5300P292	PLY S2M-59-G-0.8-24
PR5300P290	PLY S2M-20-G-0.8-50
PR5300P289	PLY S2M-56-G-40
PR5300P243	GER-1.0-14-0.8-56
PR5300P242	GER-1.0-28
PR5300P034	HEAD-PRESS-IN-BKT

Section 5 Replacement and Adjustment

5.1 Replacing Main Board (PBA-MAIN)

Step 1: Remove R-COVER

Step 2: Loosen two screws on the lower edge and remove two screws on the upper edge of MAIN-BOARD-PLT and remove a screw to fix the earth cable ,
Then, lean the board backward.

Step 3: Disconnect all harnesses from the board. (CN1 - CN12)

Step 4: Remove Main Board. (7 screws)

Step 5: Fix new Main Board onto the Printer (7 screws) and connect all harnesses.

Step 6: Make sure that the SW1 is set as NORMAL MODE.

Step 7: Raise the MAIN-BOARD-PLT and fix with screws. (4 screws)

Step 8: Attach R-COVER.

Step 9: Turn ON the power and make downloading
Download the resistance data of print head first.

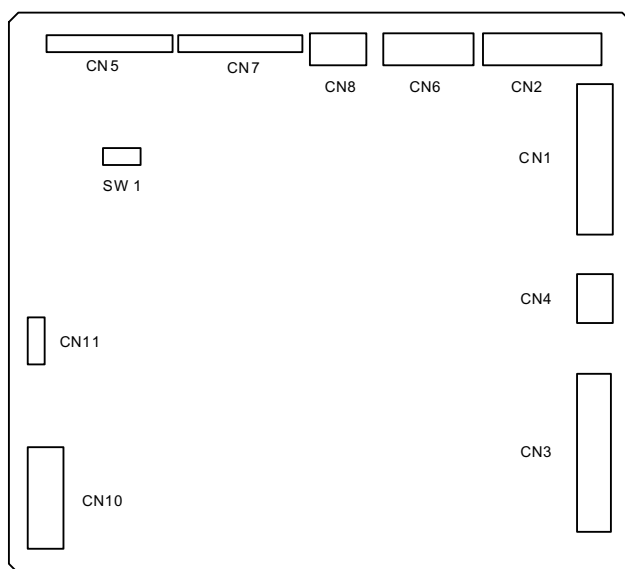
Then,:

Adjustment of Print Position, Print Uniformity, Print Density.

Adjustment of Sensor levels.

Settings to be done in User Mode Buzzer ON/OFF etc. (

Note: Turn OFF all Systems connected each other including PC when performing this operation.



5.2 Adjustment after Main Board replaced.

In the memory on the Main Board, the adjustment values for the printing operation are stored. Therefore, when replacing the main board, the adjustment in the following steps are necessary.

It is advisable to memorize these adjustment values before beginning the replacement work so that the values can be used for the new board.

If there is a difference in the print quality between before and after there placement of the thermal head, adjust as following.

For the details of the operation panel, please refer to Section 3, Operation Panel.

Items to be adjusted in the Serviceman Mode

Adjustment Items	Main Board Replacement	Thermal Head Replacement
Print position		
Print uniformity		
Print density (Color)		
Print density (BK)		
Sensor (SN10) level		

: Necessary

Φ : Depending on the print result

w : Unnecessary

Items to be set in the UserMode Main Board Replacement only (

Setting Items	Setting
Ribbon Type	Setting the ribbon type to be used
ColorAdjustment	Setting the colorforcolorprinting
Buzzer	Setting buzzer for theoccurrenceoferror
Memory Mode	Setting the image memory
SCSI ID	Setting SCSI ID number
Parity Set	Setting the parity check of SCSIcommunication
Encode Type (Note)	Setting the type of magneticencoding
Encode First (Note)	Setting priority of encoding or printing
Encode Mode (Note)	Setting the card insertion direction to theencoder
EXE Key Print	Setting the printing by EXE key
Print Retry	Setting automatic retry at the errorrecovery
Parallel Print	Setting parallel processing

Note: Setting of the encoderrelated items can only be made for the device with the built-in encoder.

5.2.1 Adjusting the Print Position

When main board is replaced, check and adjust the print position in the following procedure.

Step 1. Print Test Pattern H in the "Position Adjustment" menu of Service Mode.

Step 2. Adjust Horizontal and Vertical values so that dimensions h and v (distance from the edge of card) become 0.5 +/- 0.2mm.

Step 3. Print the Test Pattern H again and confirm the h and v dimensions. Repeat the above if necessary.

Note 1: If h, v, is smaller than 0.5mm, increase the setting value.
If h, v, is larger than 0.5mm, decrease the setting value.

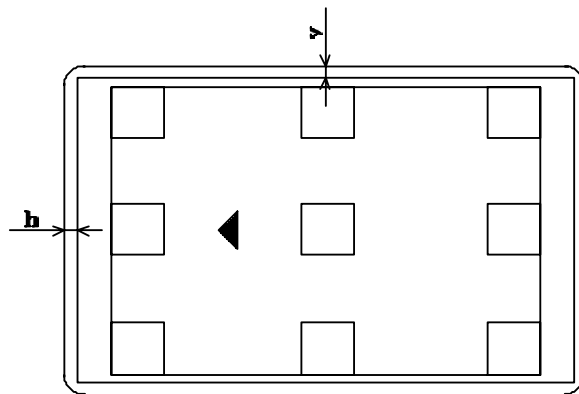
Note 2: Setting value can be calculated in the following formula.

$$H' = H + (2 - h) / 12$$

H' : New setting value (Horizontal)
H : Current value (" ")
h : measured value (mm)

V' can be obtained in the same formula.

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.



Test Pattern H

<mm - dot conversion>

The resolution of the Thermal Head is 300 dpi. Therefore, adjustment should be done in this unit. Convert the measured value into the dot number using the table below.

New Setting Value = Current Value + (0.5 - Distance from card edge)

Convert by the following table.

If the distance is (-) dot should also be (-)

0	0.00	26	2.20
1	0.08	27	2.29
2	0.17	28	2.37
3	0.25	29	2.46
4	0.34	30	2.54
5	0.42	31	2.62
6	0.51	32	2.71
7	0.59	33	2.79
8	0.68	34	2.88
9	0.76	35	2.96
10	0.85	36	3.05
11	0.93	37	3.13
12	1.02	38	3.22
13	1.10	39	3.30
14	1.19	40	3.39
15	1.27	41	3.47
16	1.35	42	3.56
17	1.44	43	3.64
18	1.52	44	3.73
19	1.61	45	3.81
20	1.69	46	3.89
21	1.78	47	3.98
22	1.86	48	4.06
23	1.95	49	4.15
24	2.03	50	4.23
25	2.12		

5.2.2 Adjustment of Print Uniformity

When the main board is replaced, check and adjust the print uniformity in the following procedure after adjusting the printhead position.

Step 1: Print Test Pattern H in "Uniformity Adjustment" menu of "Service Mode".

Step 2: Compare print density of the following three positions A, B, C, and decrease the densities of two positions to the same as the least dense position.

Step 3: Print Test Pattern H again and check the density of the three positions. Adjust again if necessary.

Note 1: Use density meter to compare the densities. If the instrument is not available, check visually.

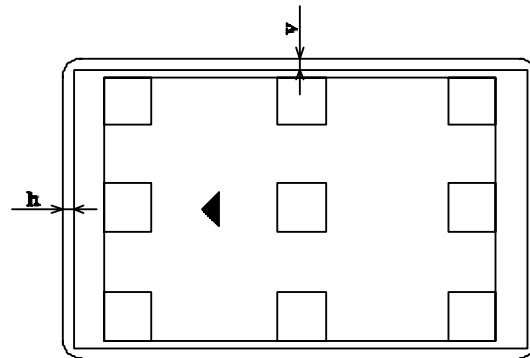
Note 2: Three positions A, B, C, correspond to the positions shown on the Operation Panel as following:

A: Upper

B: Center

C: Lower

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.



Test Pattern H

5.2.3 Adjustment of Print Density

When the main board is replaced, check and adjust the print density in the following procedure after adjusting print position and print uniformity.

Adjustment of Image and Protective Layer

Step 1: Print Test Pattern J in "OD Adjustment" menu of "Service Mode".

Step 2: Change "Color" Setting Value so that there is no color drop off and the average density of Positions A, B, C, becomes within 1.65 ± 0.05 .

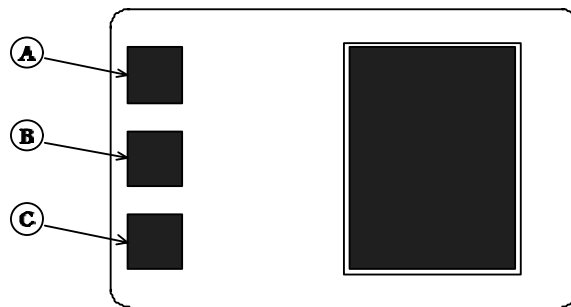
Step 3: If the starting portion of Protective Layer is not printed, increase value of "Clear". (Caution: Do not set too large value because it may cause a trouble.)

Step 4: Print Test Pattern J again to check the densities of A, B, C. Adjust again if necessary.

Note 1: Use density meter to compare the density, If instrument is not available, use sample card and compare visually.

Note 2: The larger the "Color" value, the higher the density becomes.

Note 3: Start adjustment with the current value (value before replacing Thermal Head) retained.



Test Pattern J

Adjustment of BK

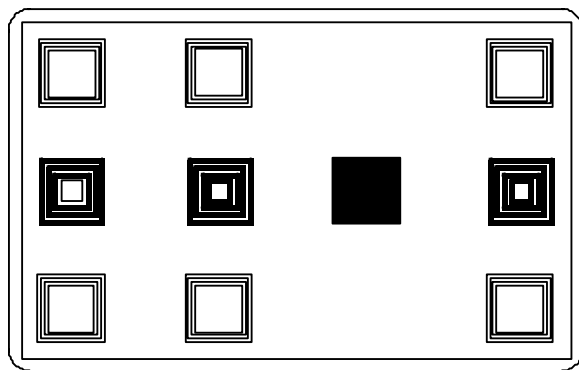
Step 1: Print Test Pattern E in "OD Adjustment" menu of "Service Mode".

Step 2: If there is a drop off in the image, increase the setting value. Conversely, if the image is too thick and lines touches each other, decrease the value.

Step 3: Print Test Pattern E again and check the print condition. Adjust again if necessary.

Note 1: Start adjustment with the current value (value before replacing Thermal Head) retained.

Note 2: As to the operation of the Operation Panel, refer to Section 3 "Operation of Operation Panel".



Test Pattern E

5.2.4 Adjustment of Sensor Level

Adjustable sensors of the Printer are factory adjusted at the time of shipment. Readjustment is necessary in the following case:

Sensor is replaced. light source, receiver()
Mechanically changed affecting the light axis.
Main Board PBA-MAIN (is replaced.)
Ribbon related error occurs frequently.

If the sensor output voltage is below the specified value in spite of the adjustment according to correct procedure, repair the defective parts as instructed in paragraph 3.

Note: Adjust the sensor output level at where the external light will not affect.
When measuring the output voltage of the sensor with volt meter, use the meter at 0.1V range.

1) Automatic Adjustment of Sensors

Step 1: With the power OFF, visually confirm that there is no card in the Printer.

Step 2: Open Ribbon Cover and pull out the Ribbon Cartridge.
Set the Ribbon Cartridge again in the position so that Yellow Part of the Ribbon comes to block the light to SN10 and close the Ribbon Cover.

Step 3: Turn ON the power and execute "Sensor Auto Adjustment" menu in "Service Mode".

Step 4: Finish "Service Mode".

Note: Refer to Sec. 3 "Operation of Operation Panel".

2) Checking Sensor Output Voltage

Following is the standard voltage reading of Test Pins on the Main Board for checking the sensor voltage with tester.

SN10 Detection of mark on the Ribbon)

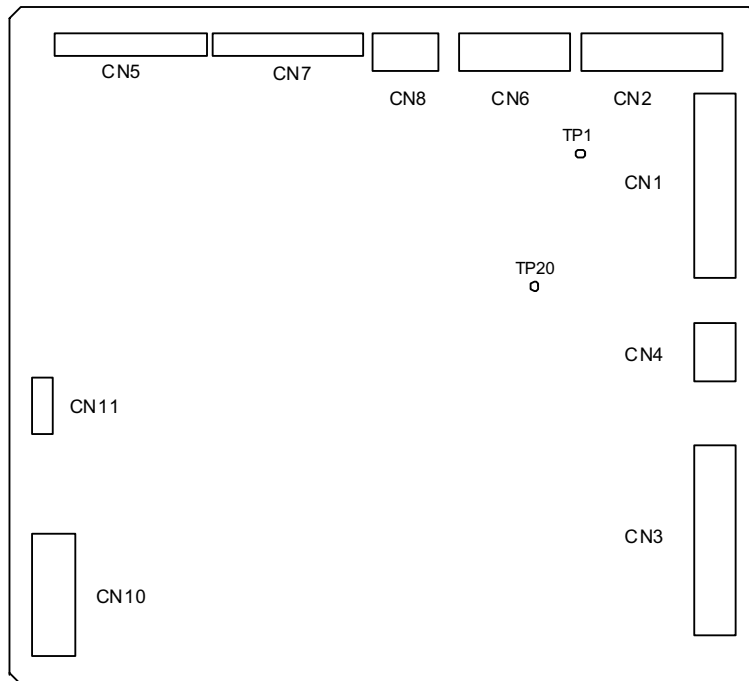
Test Pin: TP20(SN10PT)

Lighted: 1.0V or less (Yellow detection)

Blocked: 3.0V or more (Bk detection)

Note: Above voltage is between TP20 and TP1(SGND) on the Main Board.

Location of Test pins



3) Countermeasure for the Abnormal Sensor Output

If the sensor output as described in 2) is not obtained, locate the defective part and repair in the following procedure.

Possible Defect	Check and Repair
Defective connection of harness and Printed Circuit Board.	Check contact of all connectors which connect the boards with light sources and sensors to the Main Board.
	Check the contact of each harness with circuit tester following the circuit diagram and if defective connection is found, replace the harness.
Defective mounting of sensor.	Check mounting of the light sources and sensors. If incorrect mounting angle of sensor or loose screw is found, correct the mounting.
	Confirm that the light emitting face and the receiving face of the sensors are facing directly and there is nothing in between to block the light.
Defective sensor.	Replace the sensor (light emitter and receiver) and confirm normal operation.
Defective Main Circuit Board.	Replace the Main Circuit Board (PBA-MAIN) and confirm normal operation.

Note: Turn OFF the power when checking connection of harness and replacing parts.

5.3 Adjusting density of LCD Display

Density of LCDDisplay on the Operation Panel Board (PBA-OPEPANE) is adjusted to the optimum when shipping fromfactory. However, it can be adjusted by the user in the following procedure.

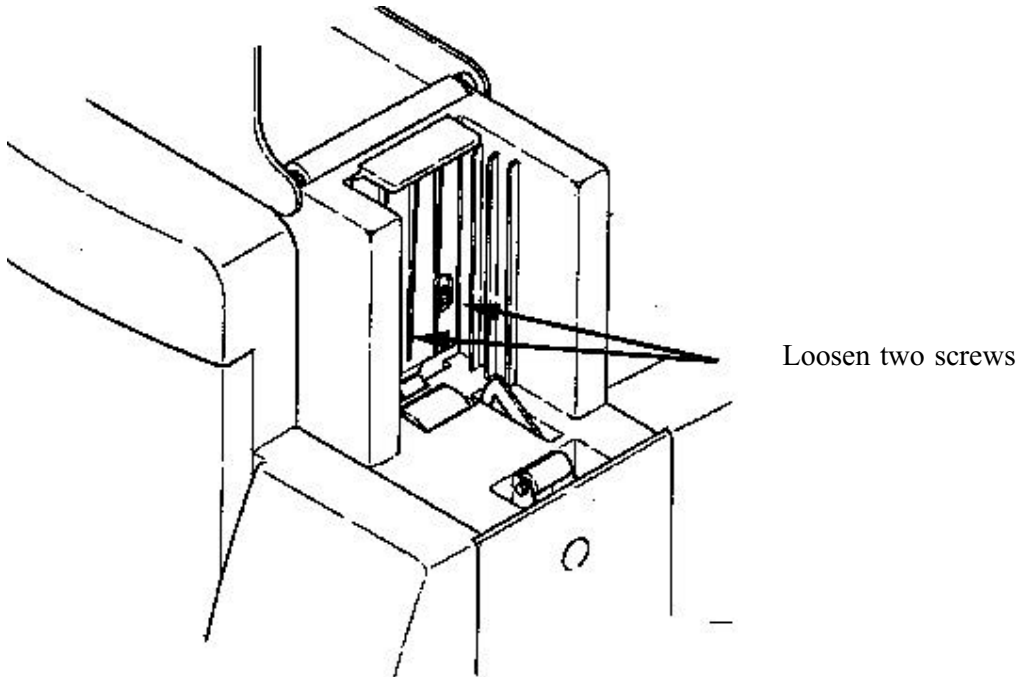
Step 1: Turn ONthepowerandget the LCD Adjustment in Service Mode.

Step 2: To make the density higher, press EXE key
To make the density higher, press EXE key

5.5 AdjustmentforCardThickness

Adjustment of Gap of Separation Gate

- Step 1. Open cover of Card Suply Box, loosen 2 screws (M3 x 8) fixing the Gate and lift the Gate.
- Step 2. Insert a flat plate 'having about 1.5 times of thickness of the card' beneath the middle of the gate and press down the Gate and tighten the screws.
- Step 3. Remove the plate.



Section 6 Troubleshooting

This paragraph deals with the causes and countermeasures for various troubles which may occur with the printer system.

6.1 Troubleshooting with the display on the LCD.

When a trouble is detected, the error indication LED on the operation panel is turned ON and the type of the trouble is shown on the LCD. In this section, the cause and the method of recovery are explained based on the display on the LCD.

The type of the error is indicated with the two digit of error code (Er) and two digit of details code (Ad).

On the LCD panel, it is shown with error message (16 digits x 2 lines: corresponding to the error code) and four digit numbers (2 digits: Er and 2 digits: Ad) on the lower right corner.

example

Front Cover is Open	12-01
------------------------	-------

In this case

Error Code (Er) : 12h

Details Code (Ad) : 01h

The details code may be indicated with the wild card (**) in this paragraph.

User operates the error recovery steps based on the error message on the LCD panel. Most of the errors can be recovered by the user. However, in case of unrecoverable error or frequent errors, the service person must be called.

When there is a service person call from users, please ask to inform detailed symptoms, error message and details code.

6.1.1 Display on the LCD and method of recovery

(1) Display of normal status

The following displays on the LCD are normal status of the printer.

To distinguish from the error, the error indication LED is not lit and the details code is not displayed.

LCDDisplay	Status
Ready to print	The printer is at the waiting status (normal status). It is possible to transfer the data from the host computer and print.
Ready to print. -Head upside-	The print head is lifted and the ribbon cassette can be removed. It is possible to transfer the data from the host computer and print.
Please wait... Initializing	Printer is being initialized.
Please wait... Now printing	Printer is processing the printing job. Depending on the setting of the memory mode, the data transfer is possible in this status.
Please wait... Heat Roll Warm Up	Optional heat roller unit is being warmed up.
Ready to Down load	This indicates that the booting as safety mode because the main program is damaged . Download the main program. Please read paragraph 7 for the downloading.
HOST -> FI Memory Loading wait	This indicates that now loading.

(2) Messages to prompt manual recovery from the error

The following messages show the steps of manual operation to recover.

When the [CLEAR] key is pressed after the error, the printer does the recovery operation if the conditions for recovery are met. If not, one of the following messages will be shown. There is no details code. (This shows the condition for recovery only and does not indicate occurrence of any error.)

If [CLEAR] key is pressed while "Ribbon Empty" or "Ribbon Take Up" error, the following message is shown:

LCDDisplay	Status	Recovery Method
Check Ink Ribbon	[CLEAR] key is pressed while Ribbon Empty or Ribbon Take Up error.	Take out the ribbon cassette and check the status of the ribbon. Then, close the Front Access Cover and press [CLEAR] key.

If the [CLEAR] key is pressed while there is "Card Empty" error, the following message is shown:

LCDDisplay	Status	Recovery Method
Card Empty	[CLEAR] key is pressed while there is no card.	Set the cards in the card hopper and press [CLEAR] key.

If the [CLEAR] key is pressed while the Front Cover is open, the following message is shown:

LCDDisplay	Status	Recovery Method
Front Cover is Open	[CLEAR] key is pressed while the Front Cover is open.	Close the Front Access Cover and press [CLEAR] key.

If the [CLEAR] key is pressed while the Top Cover is open, the following message is shown:

LCDDisplay	Status	Recovery Method
Top cover is open	[CLEAR] key is pressed while the Front Cover is open.	Close the Side Access Cover and Top Cover. Then press [CLEAR] key.

If the [CLEAR] key is pressed while the card is inside even though to try to eject a card automatically, the following message is shown:

LCDDisplay	Status	RecoveryMethod
Card Jam Remove the card	[CLEAR] key is pressed while a card is remaining inside of a machine	Turn power off and remove the card manually. See the operation manual for how to remove the card. Turn power on .

If the [CLEAR] key is pressed while the Print Head resistance data has not been loaded.

LCDDisplay	Status	RecoveryMethod
Resist Data is not loaded	[CLEAR] key is pressed while the Data is not installed	Download the resistance data of which the ser.# is matched to the ser.# of the print head. See the operation manual Section 7 for downloading.

If the [CLEAR] key is pressed while there is an "Unrecoverable error", the following message is shown:

LCDDisplay	Status	Recovery Method
Can not Recover Please Reset	[CLEAR] key is pressed while there is an unrecoverable error.	Turn OFF and ON the power, or execute RESET on the operation panel.

(3) Error message display in the normal usage of the printer

These are the errors which occur while the printer is in normal use. They are easily recoverable by the users. However, the errors may be erroneously detected by the sensor defectives. In such case, the checking and repair by the service person is necessary.

LCDDisplay	Status	RecoveryMethod
Card Empty 16-01	Card is empty.	Set the cards in the cardhopper and press [CLEAR] key.
Ribbon Empty 19-0	Printing Ribbon is finished.	Set new ribbon in the printing block and press [CLEAR] key.
Front Cover is Open 12-01	Front Access Cover is open.	Check that the Front Access Cover is positively closed and press [CLEAR] key.
Top Cover is Open 14-01	Front Access Cover is open.	Check that the Front Access Cover is positively closed and press [CLEAR] key.
Ribbon Type Incorrect 1A-**	The type of ribbon does not match the printer setting.	Check whether the ribbon type is same as the printer setting. If it is different, change the setting of the operation panel.

(4) Card jamrelated Error messages

Cardjamerrorsoccur when the card is nottransported intheprinter system as the sequence. The basic recovery steps for the card jamerrorsaredescribedbelow.

The card jam errors may be causedbythecardsbeingused.Checkif there is any problem onthecarditselfsuchasthespecification (thickness,size,etc.), bend, surface finish (anti-static treatment, specialfinish,etc.).

LCDDisplay	Status	Recovery Method
CardJam.Feeder Area- **_**	Card is notfednormally from the cardfeeder.	Check whether the cards are set correctly in the cardfeederand press [CLEAR] key.
CardJam.F.Turn Area-- **_**	Card transportation error intheflipturnblock.	Press [CLEAR] key. Ifimpossible to recover, checking and repair by service personisnecessary.
CardJam.Print Area-- **_**	Card transportation error intheprintblock.	Press [CLEAR] key. Ifimpossible to recover, check and repair by theservice person is necessary.
CardJam.Encode Area-- **_**	Card transportation error intheEncoder Unit.	Press [CLEAR] key. Ifimpossible to recover, checkandrepairby the service personisnecessary. Note) For details, refer to the Service Manual of the Encoder Unit.

(5) Error messages of the internal troubles of the printer.

The following is the error messages of the internal troubles of the printer system.

Most of those troubles needs the check and repair by the service person.

LCD Display	Status	Recovery Method
Card Jam. Unknown **_**	An unexpected card has been detected.	Turn OFF the power and remove the card manually. If this error repeats after the above operation, check and repair by the service person is necessary.
Ribbon Wind Up Quickly 1B-01	Ribbon wind up error.	Check that the ribbon is set correctly and press [CLEAR] key.
Ribbon Wind UP Slowly 1C-01		
Service Man Call error Code **_**	There is an unrecoverable error in the printer.	Turn OFF and ON the power or execute RESET. If the error repeats, check and repair by the service person is necessary.

(6) Other particular error

In case of dual side printing:

If a printing process is suspended by some errors such as card jam, it may not be continuing the process of the data for another side. In this case it will be created the error as follows.

LCDDisplay	Status	Recovery Method
Print Card does not Exist 5F-**	It cannot continue the printing since the card has ejected.	The process of printing data will be finished as error. Reissue the card.

6. 1. 2 Checking and repairing of the hardware related troubles.

Please check and repair in the following steps when the errors are not recovered by the users.

< Note > Read the following without fail before troubleshooting.

There are Error Message, Error Code, and Details Code for each error.

To find diagnosis from the LCD Display, use the combination of Error Message
Error Code (Er) and Details Code (Ad)

Use the combination of Error Code and Details Code for checking the content of
the error log.

Do not forget to turn OFF the power switch and disconnect the power cord before
performing the following operation.

E Replacing the thermal head.

E Removing the front or back cover of the printer.

E Checking connection of the harness etc.

E Replacing the parts of PCB, sensor, motor, etc.

E Installing or dismounting the Encoder Unit to the printer.

E Connecting the optional units.

E Removing the cover of the optional units.

*To use the sensor check mode to check the sensor operation with the cover removed, please
be careful not to touch the PCB. It may cause a trouble.

As it is dangerous, please carefully operate the operation panel not to move into
other mode than the sensor check mode.

Card Jam Errors are detected by the sensors located along the card path, and
classified into two categories according to the cause.

E Un-arrival Jam: In the card transportation, the card is not detected at a
specified position after a specified time.

E Staying Jam: In the card transportation, the card is staying at the position
where it should not stop at. (Undesired sensor condition).

If the error relating to the adjustable sensors repeats, the incorrect setting of the
sensor is doubted. Readjust the sensor sensitivities following the instruction in the
paragraph 3.

E SN11 Ink ribbon end sensor.

When checking the various actuators, please check that no card is remaining in
the printer. If the independent checking operation is done while the card is
remaining, it may cause other trouble.

Please follow the steps described in the paragraph 4, for cleaning of the rubber rollers.

List of the hardwareerrorrelated error messages

Error Message	Er. Code	Ad. Code	Page
Front Cover is Open	11	01	
Top Cover is Open	14	01	
CardEmpty.	16	01	
RibbonEmpty.	19	01	
RibbonTypeIncorrect.	1A	01-03	
RibbonWindupmiss.	1B	01-02	
Encoder Write Error	73	01-07 11-17 21-27	
CardJAMFeeder Area**	40,41	01-03	
CardJAMF.Turn Area**	47-4 A	01, 10-16 ff	
CardJAMPrint Area**	50-53	01, 10-18 ff	
CardJAMEncodeArea**	74,75	10-13	
PrintCarddoesnotExist	5F	01-04	
CardJAM. Unknown	28 29 2D	01-06 01-04 01-03	
Temperature out ofRange	32	01-03	
EncoderI/FError	77	10-15	
Service ManCallErrorCode	20 21 24 30 31 33 70 71 72 C0 C1 C2 C3 38 39 3A 3B 3C	01-03 01-04 01-02 01-03 01 01-10 01-03,0f ff 01-04 01-02 01-02 01 01 Particular Particular Particular Particular Particular	

(1) Card Empty

Card Empty
Er-Ad

Er	Ad	Symptom	Check/Repair
16	01	Card is not set in the feeding block. If it becomes an error despite the cards are set, see the Check/Repair section.	(1) Check the reaction of SN1 in the Sensor Check Mode. (2) If the sensor does not react normally, check the connection and electric contact of the harness. ASM-SENSOR-AE CN101 () (3) If the harness connection is normal, replace the following: ESN-1 EPBA-MAIN

(2) Front Cover Open

Front Cover is Open
Er-Ad

Er	Ad	Symptom	Check/Repair
11	01	Front Access Cover opened while the printer is idle. If it becomes an error despite the cover is closed, see the Check/Repair section.	(1) Check the reaction of SN13 to open/close of the Front Cover in the Sensor Check Mode. (2) If the sensor does not react normally, check connection and electric contact of the harness. ASM-I/L-SWE CN116 ()
12	01	Front Access Cover opened while the printer is in operation.	(3) If the harness connection is not normal, replace the following: ESN13 EPBA-MAIN

(3) Top Cover Open

Top Cover is Open Er-Ad

Er	Ad	Symptom	Check/Repair
16	01	Top Cover opened If it becomes error despite the cover is closed, see the Check/Repair section.	(1) Close the Front cover and check the reaction of SN14 to open/close of the Top Cover in the Sensor Check Mode. (2) If the sensor does not react normally, check connection and electric contact of the harness. ASM-I/L-SWE CN117 () (3) If the harness connection is not normal, replace the following: ESN14 EPBA-MAIN

(4) Ribbon Empty

Ribbon Empty **

Er	Ad	Symptom	Check/Repair
19	01	Ribbon Empty mark has been detected. If it becomes error despite the ribbon is set correctly and it has not reached at the empty mark, see the Check/Repair section.	(1) Adjust the sensor SN10 in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. ASM-SENSOR-BE CN111,CN112 () ASM-LDRELAY2E CN110,CN111 () (2) If the harness connection is normal, replace the following: ESN10 EPBA-MAIN

(5) Incorrect Setting of the RibbonType

RibbonType	
Incorrect	**

Er	Ad	Symptom	Check/Repair
1A	01 02	Distance between the edges of the ribbon is different from the setting.	(1)Clean the ribbon transportrollers. (2)Ribbon Cassette seems to be wrong. Replacethe following: ✎Ribbon Cassette
	03	Impossible to detect Ribbon Edge.	(1)Checkwhether there is a damage on the ribbon (2)Adjust thesensor SN10in the Sensor Check Mode. If impossible to adjust, check the connection and electric contact of the harness. ASM-SENSOR-1E CN111, CN112 (ASM-LD RELAY2E CN110, CN112 (3) If the connection of the harness is normal, replace thefollowing: ✎SN10 ✎PBA-MAIN

(6) Ribbon Take Up Error

Ribbon Windup	
miss	**

Er	Ad	Symptom	Check/Repair
1B	01	Take up speed of the ink ribbon is too slow. Check whether the ribbon is set correctly. This error occurs when the ribbon adheres on the card. Check if improper card is used, such as double print in. Some materials of the card may cause this trouble. If there is no problem as above, see the Check/Repair section.	(1) Check reaction of sensors SN8, SN9 in Sensor Check Mode. If the sensors do not react normally, go to (2b). (2a) If there is no problem with the sensors, motors are questionable. Check the connection and electric contact of the harness of DM1. ASM-MOTORE CN122 () (3a) If the harness connection is normal, replace the following: ERibbon Cassette EDM1 EPBA-MAIN (2b) Check connection and electrical contact of harnesses of SN8 and SN9. ESN8 ASM-SENSOR-C (CN113) ESN9 ASM-SENSOR-A (CN103) (3b) If the harness connection is normal, replace the following: ESN8 ESN9 EPBA-MAIN
	02	Take up speed of the ribbon is too fast. Check if the ribbon is correctly set. If there is a tear in the ribbon, this error occurs. Check if the adjustment of the print position in the scanning direction is appropriate. If there is no problem as above, see the Check/Repair section.	(1) Clean the ribbon transport rollers. (2) Ribbon Cassette seems to be a cause of the trouble. Replace the following: ERibbon Cassette

(7)Magnetic Encoder WritingError

Encoder Write
Error Er-Ad

Er	Ad	Symptom	Check/Repair
73	01	A writing error has occurred on ISO track 1 or JIStype2	(1)Check that the card is set correctly in card hopper. It depends on the settings in the printer and/or operation of an application to put the card surface of which has magnetic stripe side up or down. Check the magnetic stripe of the card meets a writing format.
	02		
	03		
	04		
	05		
	06		
	07		
	11	A writing error has occurred on ISO track 2	(2)Make a cleaning on encoder head. (3)Replace the encoder unit
	12		
	13		
	14		
	15		
	16		
	17		
	21	A writing error has occurred on ISO track 3	
	22		
	23		
	24		
	25		
	26		
	27		

(8) Card Jam in the Card Feed Block

Card JAM. Feeder
Area 01 Er-Ad

Er	Ad	Symptom	Check/Repair
40	01	Card does not arrive at SN2 while feeding.	(1) Check that the card is not arrived at the SN2. If it has arrived or passed through, go to (2b). (2a) Check the motion of PM1 in the Actuator Check Mode. If the motion is normal, clean the feed rollers in the card feeding block and adjust the separation gate. (3a) If it does not work normally, check the connection of harness. ASM-MOTORE CN118 () (4a) If the harness connection is normal, replace the following: PM1 EPBA-MAIN (2b) Check the reaction of SN2 in the Sensor Check Mode. (3b) If SN2 does not react, check the connection of the harness. ASM-SENSOR-BE CN105 () (4b) If the harness connection is normal, replace the following: SN2 EPBA-MAIN

(9) Card Jam in the Card Feed Block

Card JAM. Feeder
Area 02 Er-A d

Er	Ad	Symptom	Check/Repair
41	02	A card jam has occurred at SN2 while feeding.	(1) Check that the card is staying at the SN2. If there is not the card, go to (2b). The card has reached at Cleaning Roller, there is possibility of transport motor failure on Flip Turn Unit. Then see the Error Code 47 part. (2a) Check the motion of PM1 in the Actuator Check Mode. If the motion is normal, clean the feed rollers in the card feeding block and adjust the separation gate. (3a) If it does not work normally, check the connection of harness. ASM-MOTORE CN118 () (4a) If the harness connection is normal, replace the following: EPM1 EPBA-MAIN (2b) Check the reaction of SN2 in the Sensor Check Mode. (3b) If SN2 does not react, check the connection of the harness. ASM-SENSOR-BE CN105 () (4b) If the harness connection is normal, replace the following: ESN2 EPBA-MAIN

(10) Card Jam in the Flip Turn Block

Card JAM F.Turn
Area02 Er - Ad

Er	Ad	Symptom	Check/Repair
47	01 10 11 12 13 14 15 16 ff	Cardjam error in the Area02(SN2orSN3) when the card is transported from Feeder toFlip Turn. block	(1)Checkthat thecardisstayingatthe problem area. Ifthereisnotacard, goto (2b) The card has not reached atCleaningRoller, there is possibility offeeder motor failure on FeederBlock . Thensee the Error Code 41part. (2a)After removing the card, check the motion of PM2 in the Actuator CheckMode. If normal, clean the transport rollers in the flip turn block and Cleaning Roller then adjust the separation gate. (3a)IfPM2doesnotworknormally,check connection and electrical contact of the harness. ASM-MOTORE CN119 () (4a)Iftheharnessconnection is normal, replace thefollowing: EPM2 EPBA-MAIN (2b)Checkreaction of SN2andSN3intheSensor CheckMode. (3b)If SN2 or SN3 does not react, check connection and electrical contact of the harness. ESN2 ASM-SENSOR-B (CN105) ESN3 ASM-SENSOR-B (CN106) (4b)If theharness connection is normal, replace thefollowing: ESN2 or SN3 EPBA-MAIN

(11) Card Jam in the Flip Turn Block

Card JAM F. Turn
Area03 Er - A d

Er	Ad	Symptom	Check/Repair
48	01 10 11 12 13 14 15 16 ff	Cardjam error in the Area03 (Flip Turn Unit) when it is ejected from Flip Turnunit .	(1)Checkthat thecardisstayingatthe problem area. Ifthereisnotacard,goto (*b) Checkthe angle of Flip Turn unitispsitioned correctly towardFeederBlock or Print Block orMagneticEncoder Block. If itisnotpositionedcorrectly,seetheError Code 20 part. (2a)Afterremovingthecard,checkthe motion of PM2 intheActuator Check Mode. If normal,cleanthetransportrollers intheflipturnblock. (3a)IfPM2doesnotworknormally,check connection and electrical contact of the harness. ASM-MOTORE CN119 () (4a)Iftheharnessconnection is normal, replace thefollowing: EPM2 EPBA-MAIN (2b)Check reaction of SN3, SN4, SN15 (when encoderconnected) in the Sensor Check Mode. (3b)If there is any sensor which does not react, checkconnectionand electrical contact of the harness. ESN3 ASM-SENSOR-B (CN106) ESN4 ASM-SENSOR-BE CN107 () SN15E when encoderconnected) ASM-I/F-R/WE CN123 () ASM-ENCE CN123,CN124) (4b)If theharness connection is normal, replace thefollowing: ESN2 ESN3 SN15E when encoder connected) EPBA-MAIN

(12) CardJamintheFlipTurnBlock

Card JAM. F. Turn
Area04 Er-Ad

Er	Ad	Symptom	Check/Repair
44	01 10 11 12 13 14 15 16 ff	Card jam error in the Area04 (SN4) when it is transported from Feeder Block to Flip Turn Block or from FlipTurntoFeeder.	(1)Checkthat thecardisstayinginthe problem area. If nocard,goto (*b) (2a)Afterremovingthestaying card, check the motion of PM2, PM3 intheActuator Check Mode. If normal,clean both the transport rollers of FlipTurnblock and the Print Block. (3a)IfPM2andPM3doesnotwork normally,check connectionandelectrical contact of the harness. EPM2 ASM-MOTOR (CN119) EPM3 ASM-MOTOR (CN120) EPBA-MAIN (4a)Iftheharnessconnection is normal, replace thefollowing: EPM2 EPM3 EPBA-MAIN (2b)Checkthe reactionofSN4inthe Sensor Check Mode. (3b)If SN4doesnot react, checkconnectionand electrical contact of theharness. ASM-SENSOR-BE CN107 () (4b)If theharness connection is normal, replace thefollowing: ESN4 EPBA-MAIN

(12) CardJam in the Flip Turn Block

Card JAM. F. Turn
Area08 Er - Ad

Er	Ad	Symptom	Check/Repair
4A	01	Cardjam error in the	(1)Checkthat thecardisstayinginthe
	10	Area 08(SN15) whenthe	problem area. If no card, go to (2b)
	11	card is transported from	(2a)Afterremovingthestaying card, check
	12	Flip Turn toEncoder orfrom	themotion of PM2, in the Actuator
	13	Encoder to FlipTurn.	Check Mode. If normal, cleanthe
	14		transportrollers offlipturnblock.
	15		Check that there is "Encoder Check" menuinthe
	16		service mode.
	ff		If there is not "EncoderCheck"menu, the printer
			does notrecognizethe Encoder.
			Then see section 6.2 (Errors which can not be
			checkedon theLCD panel.)
			(3a)IfPM2doesnotworknormally,check
			connection andelectricalcontactoftheharness.
			ASM-MOTOIE CN119 ()
			(4a)Iftheharnessconnection is normal,replace the
			following:
			EPM2
			EPBA-MAIN
			(2b)Checkthe reactionofSN15inthe
			SensorCheck Mode.
			(3b)If SN15 does not react, check connection and
			electrical contact of theharness.
			ASM-I/F-R/WE CN123 ()
			ASM-ENCE CN123,124()
			(4b)If theharness connection is normal,
			replace thefollowing:
			ESN15
			EPBA-MAIN

(14) Card Jam in the PrintingBlock

Card JAM. Print
Area 04 Er-Ad

Er	Ad	Symptom	Check/Repair
50	01	Cardjam error in the	(1)Checkthat thecardisstayinginthe
	10	Area04(SN4) while the	problem area. If nocard,goto (*b)
	11	card is transported from	(2a)After removing the staying card,check the
	12	Print Block to Flip Turn or	motion of PM2,PM3 in the ActuatorCheck
	13	fromFlipTurn toPrintBlock.	Mode. If normal,clean the transport rollers of
	14		Flip Turn blockandthePrintBlock.
	15		(3a)IfPM2andPM3doesnotworknormally,
	16		check connection and electrical contact of the
	17		harness.
	ff		EPM2 ASM-MOTOR (119) EPM3 ASM-MOTOR (CN120) (4a)Iftheharnessconnection is normal, replace thefollowing: EPM2 EPM3 EPBA-MAIN (2b)Checkreaction of SN4inthe SensorCheck Mode. (3b)If SN4 does not react, check connection and electrical contact of theharness. ASM-SENSOR-BE CN107 (4b)If theharness connection is normal, replace thefollowing: ESN4 EPBA-MAIN

(15) Card Jam in the PrintingBlock

Card JAM. Print
Area05 Er-Ad

Card JAM. Print
Area06 Er-Ad

CardJAM.Print
Area07 Er-Ad

Er	Ad	Symptom	Check/Repair
51	01 10 11 12 13 14	Cardjam error in the Area05(SN4-SN5) while th card is transportedin the PrintBlock.	(1)Checkthat thecardisstayinginthe problem area. If nocard,goto (*b) (2a)Afterremovingthestaying card,check the motion of PM3, intheActuatorCheck Mode. If normal, cleanthe transportrollers of the PrintBlock. (3a)If PM3 does not work normally,
52	15 16 17 ff	Cardjam error in the Area06(SN5) while th card is transportedin the PrintBlock.	check connection and electricalcontactof the harness. ASM-MOTORE CN120 () (4a)Iftheharnessconnection is normal, replace thefollowing: EPM3 EPBA-MAIN (2b)Checkthe reactionofSN5inthe SensorCheck Mode. (3b)If SN5doesnot react, checkconnectionand electrical contact ofthe harness.
53		Cardjam error in the Area07(not at SN5) while the card is transported in the PrintBlock.	ASM-SENSOR-BE CN109 () ASM-SENSOR-RELAYE CN108,109 () (4b)If theharness connection is normal, replace thefollowing: ESN5 EPBA-MAIN

(16) Card Jam error in Encoder

Card JAM. Encode
Area 08 Er - Ad

Er	Ad	Symptom	Check/Repair
74	10 11 12 13	Card jam error in the Area08 (SN15) while the card is transported from Encoder to Flip Turn or from Flip Turn to Encoder.	(1) Check that the card is staying in the problem area. If no card, goto (*b) (2a) After removing the staying card, check the motion of PM2 in the Actuator Check Mode. If normal, clean the transport rollers of the Encoder. Check the transport roller working normally. If it does not work normally, replace the Encoder. (3a) If PM2 does not work normally, check connection and electrical contact of the harness. ASM-MOTORE CN119 () (4a) If the harness connection is normal, replace the following: EPM2 EPBA-MAIN (2b) Check the reaction of SN15 in the Sensor Check Mode. (3b) If SN15 does not react, check connection and electrical contact of the harness. ASM-IF-R/WE CN123 () ASM-ENCE CN123 CN124 () (4b) If the harness connection is normal, replace the following: ESN15 EPBA-MAIN

(17) Card Jam error in Encoder

Card JAM. Encode
Area 09 Er - Ad

Er	Ad	Symptom	Check/Repair
75	10 11 12 13	Cardjam error in the Area09 (SN15) while the card is transported in Encoder .	(1) Checkthat thecardisstaying inthe problem area. If nocard,replacefollowing things. (2a)Checkthere is something of which obstruct the cardtransportationarround the stacked card. Afterremovingstacked card, thencheck roller working intheEncoder. Ifitdoesnotworkcorrectly, replacethe Encoder.

(18) Un-distinction Card Jam

Card JAM.

Unknown Er - Ad

Er	Ad	Symptom	Check/Repair
28	01	A card was detectedat the SN2 whileF.Turnunit is not at the position of card entered.	(1) Remove all cards intheprinter andturn OFF and ON thepowerswitch. Incaseoftheerror"28-01"hasoccured then adjust separationgategap. (2) If impossible to recover, check reaction of sensors SN2 - SN5,SN15 in the Sensor Check Mode. (3) Iftherearesensorswhichdo not react, checkconnection and electricalcontact of the corresponding harnesses. (4) Iftheharnessconnectionsare normal, replace correspondingsensorsormain printed circuit board.
	02	There are some cards in F.Turnunit.	
	03		
	04		
	05		
	06		
29	01		
	02		
	03		
	04		
2D	01	There is anunsupposed card insideof printerwhenprinter is retrieved from anyerror situation.	
	02		
	03		Morethan 3 cards are detected in the printer.

(19) Abnormal temperature of thermal head and/or mainboard

Temperature out of Range Er - Ad
--

Er	Ad	Symptom	Check/Repair
32	80	Head temperature is out of range.	(1) Checkconnection and electrical contact of the harness of the thermal head. ASM-HEAD (2) Iftheharnessconnection is normal, replace thefollowing. Thermal Head PBA-MAIN
	02	Temperaturearroundthe main boardisout ofrange	(1) Makesure ofambienttemperature is in the range of what is mentioned inusermanyual (2) Ifthetemperature is in that range, replace the following. PBA-MAIN
	03	Head temperature or Temperature arroundthe main boardisout ofrange.	See above

(20) CommunicationErrorwith Encoder

EncoderI/F Error Er-Ad

Er	Ad	Symptom	Check/Repair
77	10	Some error has occured with communicationbeteewn priner and encoder.	(1) Checkconnection and electrical contact of the harness. ASM-ENC ASM-POW/ENC (2) Iftheharnessconnection is normal, replace thefollowing. PBA-MAIN Encoder

(21) Hardware damage

Service Man Call

Error Code **

Er	Ad	Symptom	Check/Repair
20	01 02 03	When rotating the flip turn unit, the objective angle is not detected in the specified steps.	(1) Open the top cover and check if there is an obstacle such as a card. (2) If there is a card protruding from the flip turn unit and hitting the sensor etc., card transport accuracy defect is doubted. Remove the staying card and clean the transport rollers in the flip turn unit. (3) If there is no obstacle, it may misalign with shade plates each other. One is for F.turn home position and another is for F.turn direction sensor. Check them fixed correctly.
21	01 02	No signal fed back from the sensor, when F.Turn unit rotating.	(1) Open the top cover and check if there is an obstacle such as a card. (2) If there is a card protruding from the flip turn unit and hitting the sensor etc., card transport accuracy defect is doubted. Remove the staying card and clean the transport rollers in the flip turn unit. (3) If there is no obstacle, check reaction of the F.Turn home position sensor (SN6) in the Sensor Check Mode. If there is sensor not reacting, go to (4b) (4a) PM1 is doubted. Check the motion of PM1 in the Actuator Check Mode. (5a) If PM1 does not work, check connection and electrical contact of the harness. ASM-MOTORE CN118 () (6a) If the harness connection is normal, replace the following: EPM1 EPBA-MAIN

Er	Ad	Symptom	Check/Repair
21	01 02	No signal fed back from the sensor, when F.Turn unit rotating.	(4b) Turn angle sensors are doubted. Check connection and electrical contact of the harness. ASM-SENSOR-AE CN102 () (5b) If the harness connection is normal, replace the following: ESN6 EPBA-MAIN
22	03 04	No signal fed back from the sensor, when F.Turn unit rotating.	(1) Open the top cover and check if there is an obstacle such as a card. (2) If there is a card protruding from the flip turn unit and hitting the sensor etc., card transport accuracy defect is doubted. Remove the staying card and clean the transport rollers in the flip turn unit. (3) If there is no obstacle, check reaction of the F.Turn home position sensor (SN7) in the Sensor Check Mode. If there is sensors not reacting, go to (4b) (4a) PM1 is doubted. Check the motion of PM1 in the Actuator Check Mode. (5a) If PM1 does not work, check connection and electrical contact of the harness. ASM-MOTORE CN118 () (6a) If the harness connection is normal, replace the following: EPM1 EPBA-MAIN (4b) Turn angle sensors are doubted. Check connection and electrical contact of the harness. ASM-SENSOR-AE CN104 () (5b) If the harness connection is normal, replace the following: ESN7 EPBA-MAIN

Er	Ad	Symptom	Check/Repair
24	01 02	Head is not detected in the specified position within the specified time when the head lifting motor is activated.	(1) Check the motion of DM3 in the Actuator Check Mode. If the motor works normally, go to (2b). (2a) DM1 is doubted. Check connection and electrical contact of the harness. ASM-MOTORE CN122 () (3a) If the harness connection is normal, replace the following: EDM1 EPBA-MAIN (2b) The head position sensors seem to have a problem. (SN11, SN12) Check connection and electrical contact of the harnesses. ASM-SENSOR-CE CN114 for SN1 () ASM-SENSOR-CE CN121 for SN2 () (3b) If the harness connection is normal, replace the following: EN11 EN12 EPBA-MAIN
30	01 02 03	Impossible to adjust ribbon leading edge sensor properly.	(1) Check connection and electrical contact of the harnesses. ASM-SENSOR-BE CN111, CN112 () ASM-LDRELAY 2E CN110, CN111 () (2) If the harness connection is normal, replace the following: SN10E LD () SN10E PT () EPBA-MAIN

Er	Ad	Symptom	Check/Repair
31	01	Head cooling fan trouble has been detected.	(1) Check connection and electrical contact of the harnesses. ASM-MOTORE CN121 () (2) If the harness connection is normal, replace the following: EHFAN EPBA-MAIN
33	01 02 03 04 05 06 07 08 09 0a 0b 0c	It is not normal when beginning to access to image memory.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, main board is suspected. Replace the PBA-MAIN
C0	01 02	It is not normal when finishing to access to image memory.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, main board is suspected. Replace the PBA-MAIN
C1	01 02	It is not normal when beginning to access to flash memory.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, main board is suspected. Replace the PBA-MAIN
C3	01	It is not normal when finishing to access to image memory. Note In this case, it may go to the contents in User Mode back to initial settings of which had been set in factory.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, main board is suspected. Replace the PBA-MAIN

Er	Ad	Symptom	Check/Repair
70	01 02 03 04 05 06 07 08 09	Some Error of which relation to communication has occurred on encoder.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, encoder is suspected. Replace the encoder.
71	ff	Unsupported encoder has connected.	Use correct encoder.
72	01 02 03 04	There is a card in the encoder Some failure has occurred with action of shutter on encoder. Some failure has occurred with card transportation in the encoder. Some failure has occurred with card transportation from F. Turn to encoder.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, main board is suspected. Replace the PBA-MAIN
38 39 3A 3B 3C C2	**	There is an error in the result from program calculation.	(1) Turn OFF and ON the power switch. (2) If this symptom repeats, contact the manufacturer.

6.1.3 Error Message Relating to Communication

Following is the errors relating to the communication between host PC and the Printer.

Errors relating to command transmission/reception is displayed on the LCD panel, it is shown with error message (16 digits x 2 lines: corresponding to the error code) and four digit numbers (2 digits :Er and 2 digits:Ad) on the lower right corner.

example

Printer is not Ready 92 - 49

In this case

Error Code (Er) : 92h

Details Code (Ad) : 49h

ErrorMessage: Indicates the cause and nature of the error.

Error Code: Encoded error message

Details Code: Indicated the command received which has caused the error as shown as Error Message.

Refer to the "Command Specification" regarding the details.

Errors in the transmission/reception of commands are usually caused by errors in the data or sentence which are transmitted from the host PC. Therefore, the user and/or the software developer are required to cope with.

Errors in the transmission/reception of commands are cleared automatically when the following conditions are met.

I/F SCSI : Received commands other than "Request Sense" from the initiator which has returned "Check Command".

IEEE1284: Changed the direction of data transported as shown below after some error has occurred. (Sending the error contents ----> Receiving other command)
Reverse ----> Forward

Errors in communication, other than "Unrecoverable Error" can be recovered by pressing CLEAR key.

No.	LCD Display	Contents	Method to Recover
80	Unsupported SCSI Command Er-Ad	Received SCSI Command is not supported.	(1) Check whether the transmitted SCSI Command is listed in the Command Specification. (2) Clear the error by pressing the CLEAR key and send the command again.
81	Parameter List Length Err Er-Ad	Group Code of the received SCSI command does not meet with the specification or actually transmitted byte does not match the set byte number.	(1) Check the group code of the sent SCSI command and transfer byte number of the command description block. (2) Clear the error by pressing CLEAR key and send the command again.
82	Invalid Field in CDB. Er-Ad	There is error in the description block of the received SCSI command	(1) Check if the command description block meets the contents of the Command Specification. (2) Clear the error by pressing the CLEAR key and send the command again.
83	Logical Unit Not Supported Er-Ad	LUN of the received SCSI command is not zero.	(1) Check whether the LUN of the command description block is zero or not. (2) Press CLEAR key to clear the error and send the command again.

No.	LCD Display	Contents	Method to Recover
85	SCSI Parity Error Er-Ad	Parity error has occurred while communicating through SCSI interface.	(1) Turn OFF the power and check the command and data. Check whether the SCSI controller of the host supports the parity adding function. If not supporting, select "Parity OFF" on the Operation Panel and communicate. (2) If the error repeats, replace the following. PBA-IF
86 87 8D	SCSI Hardware Error. Er-Ad	Error occurred in the SCSI protocol control on the interface board.	(1) This is unrecoverable error. Turn OFF and On the power. (2) If the error repeats, replace the following. PBA-IF
88	SCSI Command Time Out. Er-Ad	Time out error has occurred while receiving command and data.	(1) Check if the transmitted command and data is in accordance with the command specification. Also, check the setting of the number of byte of the transmitted data. (2) Press CLEAR key to clear the error and transmit the command again.
89	Invalid field in Identify Er-Ad	There is error in the Identify of the received SCSI.	(1) Check the transmitted description of Identify. (2) Press CLEAR key to clear the error and transmit the command again.

No	LCDDisplay	Contents	Method to Recover
8A	MessageOutData Length Err Er-Ad	The data length of Message Out phase is over 33 bytes	(1) Check the number of bytes of message transmitted. (2) Press CLEAR key to clear the error and transmit the command again.
90 97 98 99 9A	Unsupported Print CMD Er-Ad	Received Print command is not supported.	(1) Check whether the trans- mitted command is in accordance with the command specification. (2) Clear the error with CLEAR key and transmit the command again.
92	Printer is not Ready. Er-Ad	Read Magnetic Encode command was received while the printer (mechanical control module) is not ready	(1) Check whether the printer is in ready condition before transmitting the Read Magnetic Encode command. (2) Transmit the command again after clearing the error with "CLEAR" key.
93	Print Command Parameter Er-Ad	Parameter of the received Print command is incorrect.	(1) Check whether the Para- meter is in accordance with the specification. (2) Clear the error with CLEAR key and transmit the command again.
94	MultiParameter Received Er-Ad	An error that received Print Command repeatedly while receiving request plural times to flip over.	(1) Check whether the Print command is transferred repeatedly to the same memory when transferring the request plural times to flip over. (2) Clear the error with CLEAR key and transmit the command again.
95	Transfer Byte Size Error. Er-Ad	Actual number of trans- mitted byte does not match the designated number of byte.	(1) Check the designated byte number of the trans- mitted command and the actual byte number. (2) Clear the error with CLEAR key and transmit the command again.
96	PreTransfer not Completed. Er-Ad	The Print Data Transferring Command is received while not completed to receive previous Print Data Transferring Command	(1) Check whether the Para- meter is in accordance with the specification. (2) Clear the error with CLEAR key and transmit the command again.

No	LCDDisplay	Contents	Method toRecover
A0	Print DataSize OverError Er-Ad	Received Print Data is larger thantheprintable area of card.	(1) Checkthe print start position andprintsiz e of the transmittedPrint data. (2) Clear the error with CLEARkeyand transmit the data again.
A1	Barcode Data Size Over. Er-Ad	Receivedbarcode data has toomany characters or toolarge size.	(1) Checkthe character numberandbarcodecrea- tioncondition. (2) Clear the error with CLEARkeyand transmit the commandagain.
A2	EncodeData Size Over. Er-Ad	Number of characters of the receivedmagnetic encode data exceeds the standard.	(1) Checkwhetherthe type and number of the magnet- ic encoding characters meets the standard. (2) Clear the error with CLEARkeyand transmit the commandagain.
A3	EncodeFormat Select Error. Er-Ad	Encode Unit which supports the designated magneticencodingtype is not connected.	(1) Checkwhetherthe record- ing type of the magnetic encodings of actually connectedEncode Unit matches with theset type (2) Clear the error with CLEARkeyand transmit the commandagain.
A5	ICEncoder not Connected Er-Ad	ICencoding request command has been received while IC EncodeUnit is not connected.	(1) Turn OFF the power and checkthe connection of the IC Encode Unit. (2) Clear the error with CLEARkeyand transmit the commandagain.

No	LCDDisplay	Contents	Method toRecover
A6	Heat Roller Unit notConnected. Er-Ad	Hologram print command has been received while Heat Roller Unit is not connected.	(1) Turn OFF the power and checkthe connection of the Heat Roller Unit. (2) Clear the error with CLEARkeyand transmit the commandagain.
A8	Encode/Barcode Data Empty. Er-Ad	Magnetic encode or barcodedatahasbeen received while the transmission byte number is zero.	(1)Checkwhethertheformat and thenumber of transf- er byte of magnetic encode or barcode and thedata are transmitted correctly. (2) Clear the error with CLEARkeyand transmit the commandagain.
A9	Character Error inEncode. Er-Ad	Magnetic encode data has characters which is notstandard.	(1) Checkwhethernon standard characters are included inthecharacter chain and recording type of the magnetic encode. (2) Clear the error with CLEARkeyand transmit the commandagain.
AA	Character Error inBarcode. Er-Ad	Nonstandardcharacter is in the barcodedata.	(1) Checkthe type of barcode and character string to see whether non standard characters are included. (2) Clear the error with CLEARkeyand transmit the commandagain.

6.2 Errors which can not be checked on the LCD panel.

The recovery methods for the troubles that are not checked on the LCD panel are described in the following.

<Note> Do not fail to read before troubleshooting.

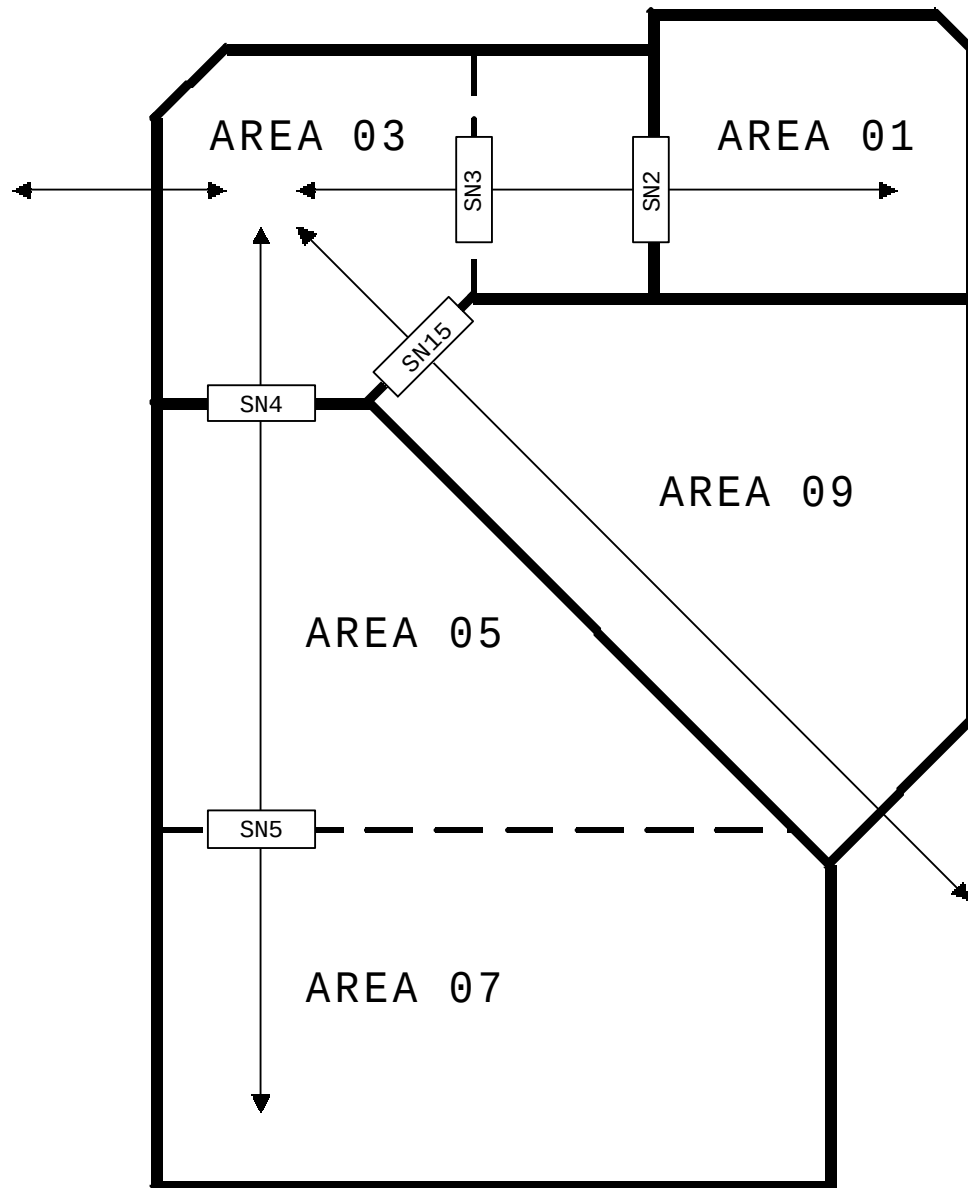
When performing the following works, turn OFF the power switch and plug off the power cord from the outlet without fail.

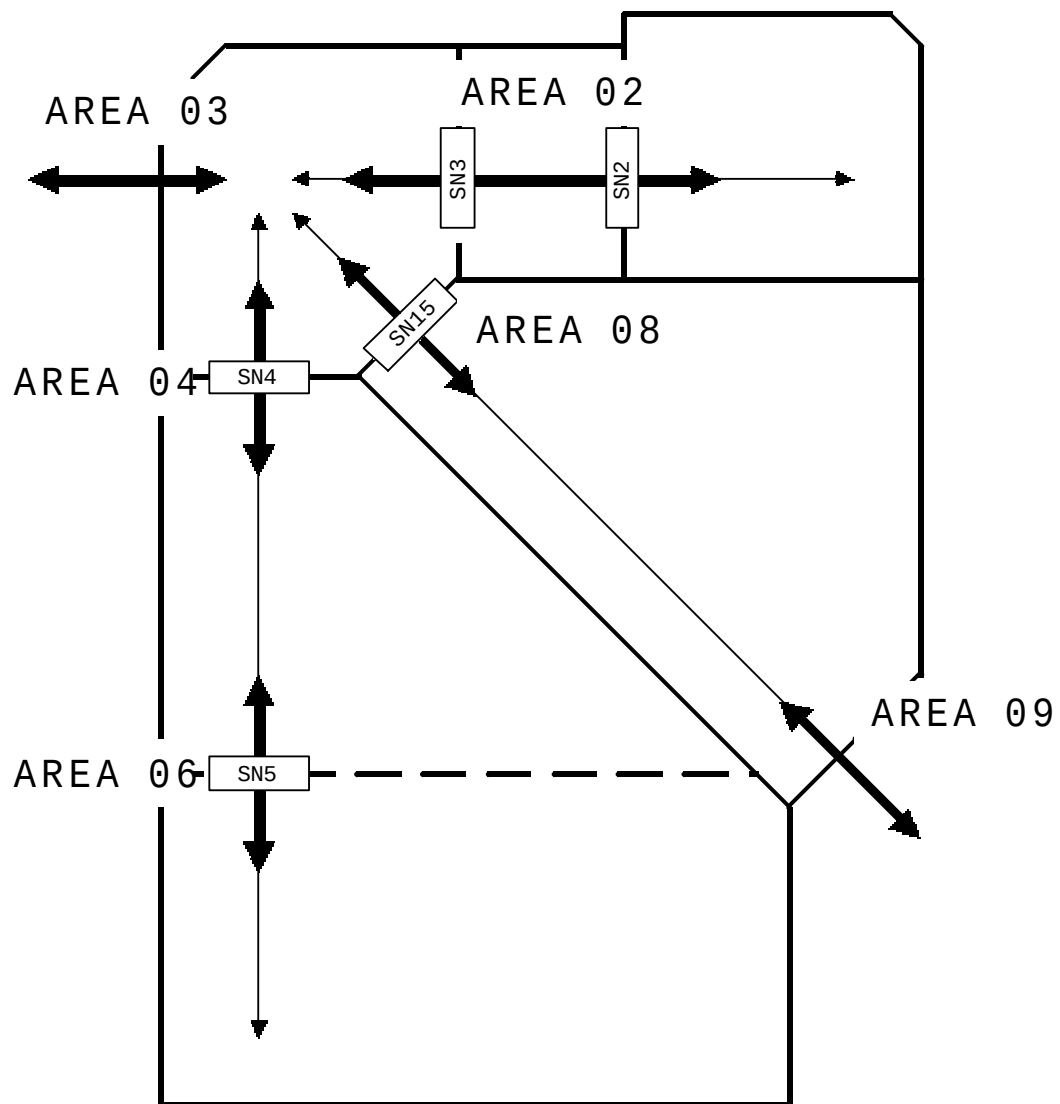
- Replacing the thermal head
- Removing front and/or rear cover of the printer
- Checking the connection and electrical contact of harness
- Replacing the parts such as printed circuit board, sensor, motor, etc.
- Removing or mounting the encoder unit into the printer unit.
- Connecting the optional units
- Removing covers of the optional units

Symptom	Condition	Check/Repair
LED does not light when the power is turned ON.	AC power is not supplied.	(1) Check if the power supply matches specification (voltage range) of the product. (2) Check whether the cable is correctly connected. (3) Check whether the circuit protector is in normal condition.
	Harness connection is not normal.	(1) Check the harness connections. EASM-AC1 EASM-AC2 EASM-DC EASM-OPERATION
	Defective circuit boards.	(1) Replace the following and check operation. EPWS-RPS-9286 EPBA-OPEPANE
Nothing is shown on the LCD panel when power is turned ON. (LED lights)	Harness connection is not normal.	(1) Check the harness connection. EASM-OPERATION
	Defective circuit boards.	(1) Replace the following and check operation. EPBA-OPEPANE EPBA-MAIN
	Defective base ROM or its mounting defect.	(1) Make sure the SW1 on the PBA-MAIN is set as "NORMAL MODE"

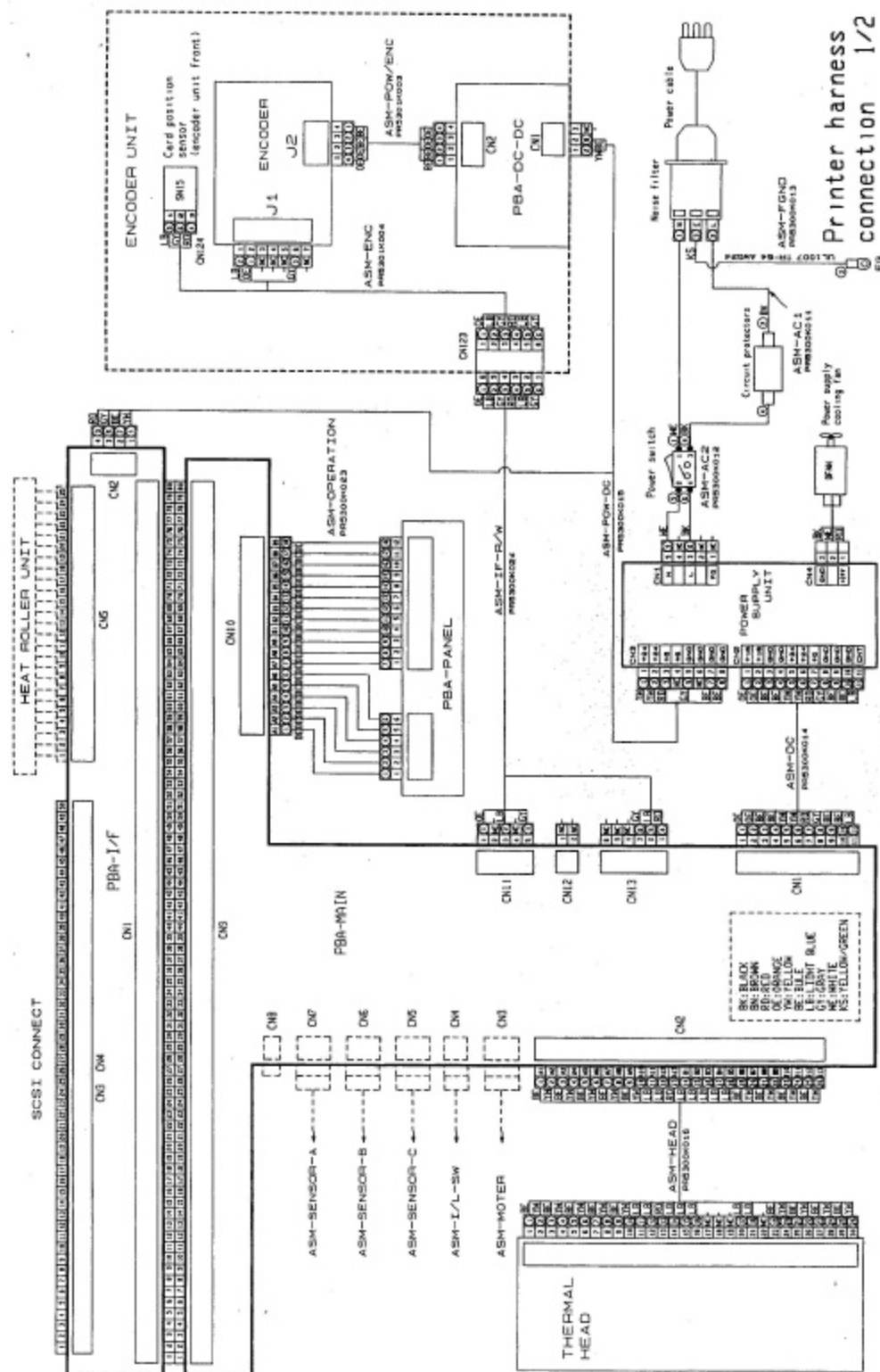
Symptom	Condition	Check/Repair
White line appears in the Longitudinal direction when printing the image and characters.	Dot defect of the thermal head.	(1) Turn OFF the power and replace the following: E Thermal Head Assembly
Image and characters are not printed at all when printing the image and characters.	Defective harness connection.	(1) Check the harness connection. E ASM- HEAD E ASM- DC
	Defective thermal head.	(1) Turn OFF the power and replace the following: E Thermal Head Assembly
	Defective circuit board.	(1) Turn OFF the power and replace the following: E PBA-MAIN
Image defectiveness such as uneven color or lost lines, etc. when printing the image and characters	Defective image memory.	(1) Check the image memory (frame memory) using the Hardware check function in the serviceman mode.
	Defective circuit board.	(1) Turn OFF the power and replace the following: E PBA-MAIN
Printer does not respond when data is transmitted from the host computer.	Defective connection of the cable, terminators	(1) Turn OFF the power and check the SCSI cable connection. (2) Check overall connections of the cables, and connection of the terminator. Check the setting of the SCSI ID numbers.
	Defective circuit board.	(1) Turn OFF the power, replace the following and check operation. PBA-IF-SCSI E SCSI Type equipment PBA-PIE IEEE1284 Type equipment

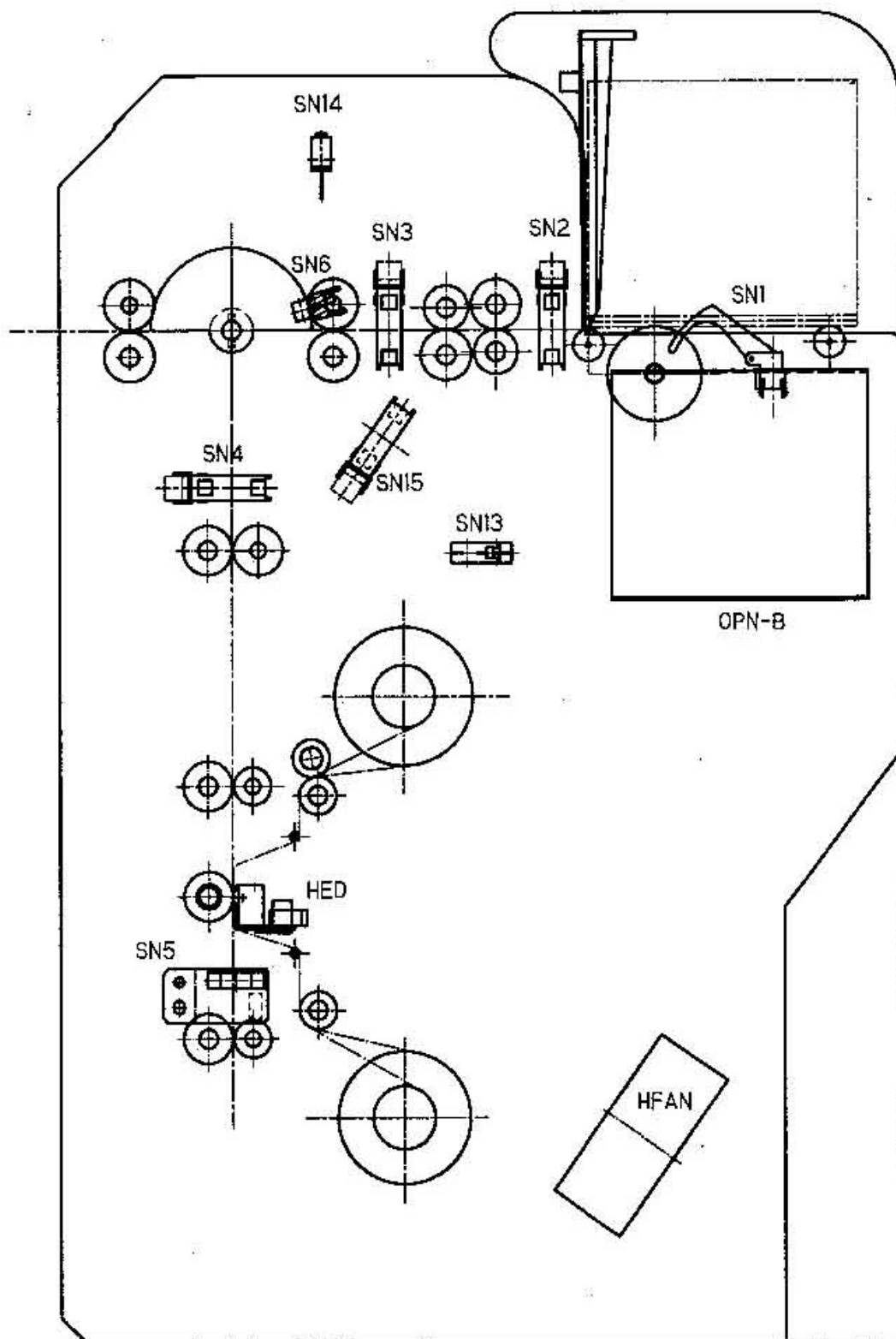
Card JAM Location



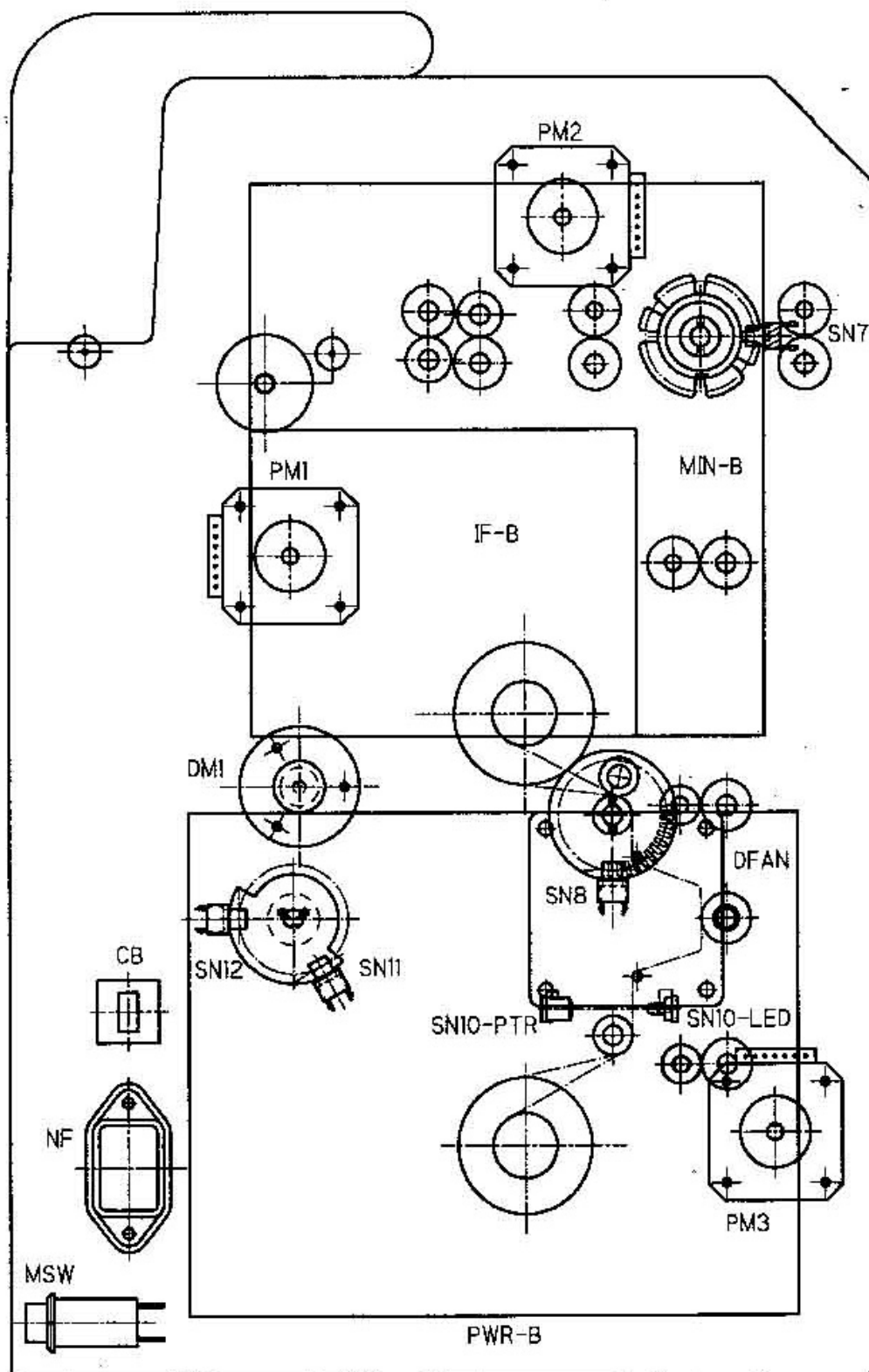


Section 7 Appendix





FRONT SIDE



BACK SIDE
7-4

Card Printer PR5300 Parts LIST

Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
C8	338412	ｼﾞｸｳｹ 8	Bearing8	3	
C6	338422	ｼﾞｸｳｹ 6	Bearing6	6	
B1	020100FZWS	ﾜﾔﾑｽ M2X10	ScrewM2*10WS	2	
B2	025050FZNS	ﾈｼﾞ	ScrewM2.5*5NS	4	
B3	030060FZBB	ﾈｼﾞ	ScrewM3*6BB	1	
B4	030060FZSA	ｻﾗ ﾈｼﾞ M3X6	ScrewM3*6SA	2	
B5	030060FZTP	IT ﾀｯﾌﾟﾀｲﾄ M3X6	ScrewM3*6TP	23	
B6	030060FZTW	ｺﾈｼﾞ	ScrewM3*6TW	70	
B7	030080FZBB	M3X8 Bﾀｲﾄ	ScrewM3*8BB	9	
B8	030080FZWS	ｺﾈｼﾞ	ScrewM3*8WS	3	
B9	030120FZWS	ｺﾈｼﾞ	ScrewM3*12WS	2	
B10	040080FNBI	ｺﾈｼﾞ	ScrewM4*8BI	11	
B12	040080FNTP	IT ﾀｯﾌﾟﾀｲﾄ M4X8	ScrewM4*8TP	1	
B13	040100FZWS	ｺﾈｼﾞ	ScrewM4*10WS	3	
B14	040300FZWS	ﾜﾔﾑｽ M4X30	ScrewM4*30WS	4	
B15	030060FNWS	ﾜﾔﾑｽ M3X60	ScrewM3*60WS	1	
H1	HP020100SCH	ﾍｲｺｳﾋﾞﾝ 2X10	Pin2*10	7	
H2	HP020120SCH	ﾍｲｺｳﾋﾞﾝ 2X12	Pin2*12	2	
H3	SP02010FPA	ｽﾌﾟﾘﾝｸﾞﾋﾞﾝ 2X10	SpringPin2*10	2	
H4	SP02010S-B	ｽﾌﾟﾘﾝｸﾞﾋﾞﾝ 2X10	SpringPin2*10	11	
E1	ER030SKP	E リﾝｸﾞ 3	E Ring 3	11	
E2	ER040SKP	E リﾝｸﾞ 4	E Ring 4	32	
E3	ER050SKP	E リﾝｸﾞ 5	E Ring 5	17	
E4	PF2166P034B2	CLIP-5	Clip Ring 5	35	Original Ring
W1	HW030FBM	ﾜｯｼﾞｬｰ	Washer	1	
W2	KW040RN-	ｷｸｻﾞ	Wave Washer	2	
W3	CL030016FZ	ｽﾍﾞｰｻｰ ﾏｯﾁｭｳ	Collar 3*16	3	

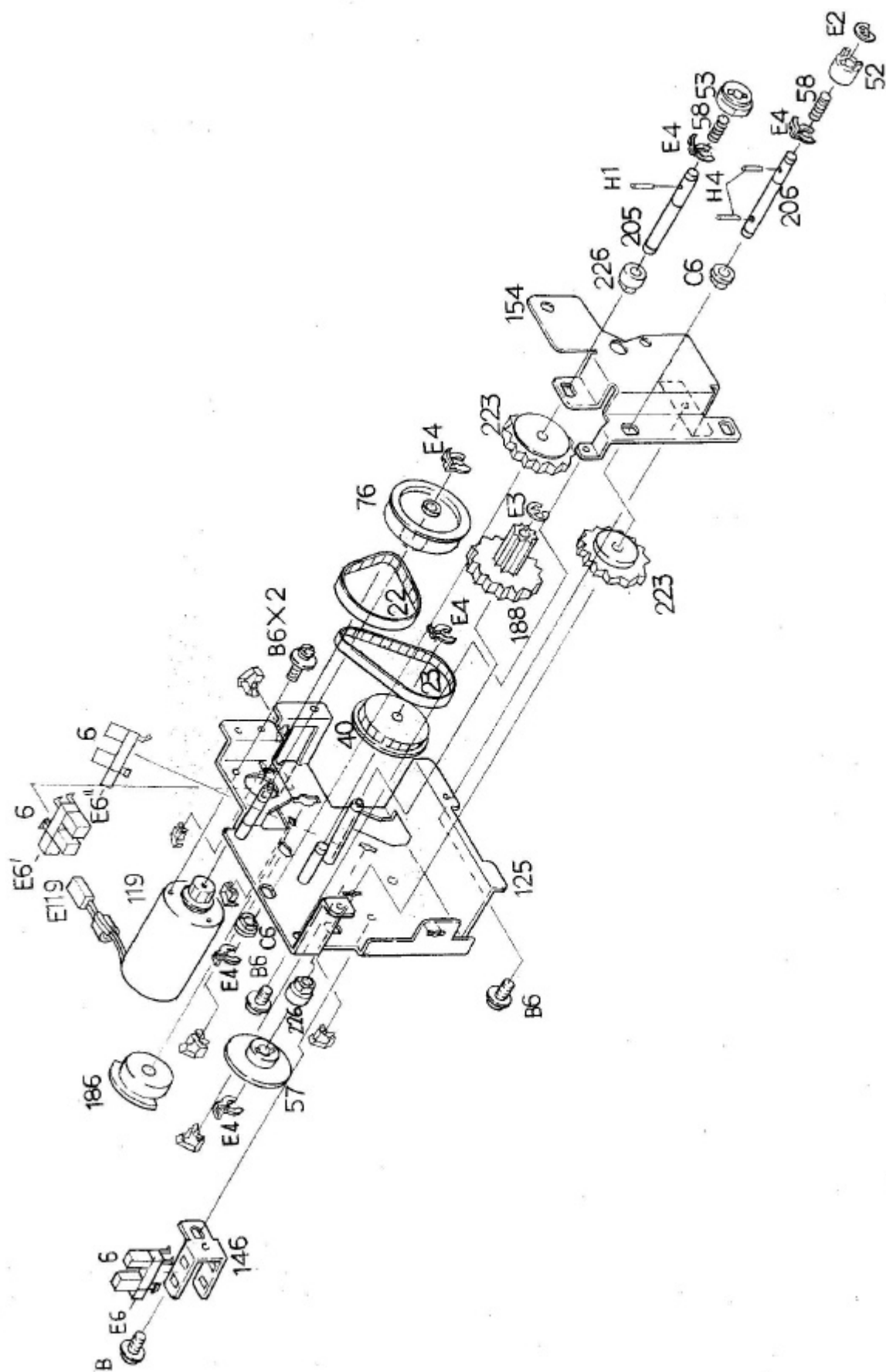
Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
1	E120001175	W28XQ1A3	W28XQ1A3	1	Circuit Breaker
2	E120001551	DE2L-FAAA	DE2L-FAAA	2	SN13,14
3	E120001572	AJ7211B	AJ7211B	1	Power Switch
4	E240000321	SUP-B3G-ER	SUP-B3G-ER	1	Noise Filter
5	E314000521	LG-409A3	LG-409A3	1	SN1
6	E314000619	TLP1241(C5)	TLP1241(C5)	5	SN6,7,8,11,12
7	E314000660	KI1220-NA02	KI1220-NA02	3	SN2,3,4
8	E450000005	SKB-1M	SKB-1M	3	Cable Clamp
9	E450000504	EDS-1717U	EDS-1717U	3	Cable Guide
10	E450000696	EDS-1208U	EDS-1208U	3	Cable Guide
11	E450001004	SQ-14	SQ-14	1	Boad Support
12	E450001139	RLWS-1T V0	RLWS-1T V0	11	Cable Guide
13	E450001140	RLWS-3T V0	RLWS-3T V0	6	Cable Guide
14	E450001146	RLMC-01T V0	RLMC-01T V0	3	Cable Guide
15	E450001148	RLMC-05T V0	RLMC-05T V0	8	Cable Guide
16	E314000521	175694-3	175694-3	1	Connecter
17					
18					
19	NS-BLT00064A	BELTS2M071040	BELTS2M071040	2	
20	NS-BLT00068A	BELTS2M076040	BELTS2M076040	1	
21	NS-BLT00071A	BELTS2M080040	BELTS2M080040	1	
22	NS-BLT00074A	BELTS2M083040	BELTS2M083040	1	
23	NS-BLT00076A	BELTS2M090040	BELTS2M090040	1	
24	NS-BLT00083A	BELTS2M084040	BELTS2M084040	1	
25	NS-BLT00094A	BELTS2M115040	BELTS2M115040	1	
26	NS-BRG00067A	BEARINGRBB060130F	BEARINGRBB060130F	2	
27					
28					
29	PF2078P023	M3 タンベ`ス 1.4	Screw 1.4 M3	1	
30	PF2078P086	M3 タンベ`ス 2.2	Screw 2.2 M3	4	
31	PF2144P013	センサー ホルダー	Sensor Holder	1	
32	PF2147P021	RK18 プ`ーリー	RK18 Pulley	2	
33	PF2147P032	RK 17 フランジ`	RK17 Flange	5	
34	PF2158P521	シ`クウケ-6	Bearing-6	14	
35	PF2164P330	M3X6 マルタップ`	Screw M3*6R	10	
36	PF2185P009	GER-080-24	GER-080-24	2	
37	PF2198P003	PLY-S2M-56	PLY-S2M-56	1	
38	PF2198P311	M4X11 マルタップ`	Screw M4*11R	2	
39	PF2205P008	GER-080-22-OW	GER-080-22-OW	1	
40	PR5300P292	PLY-S2M-59-G-0.8-24	PLY-S2M-59-G-0.8-24	1	
41	PF2210P054	PULLEY-G-IDOL-40-0.8	PULLEY-G-IDOL-40-0.8	2	
42	PF2215P004	GER-0.8-20-OW (G655)	GER-0.8-20-OW (G655)	2	
43	PF2225P025	ROLLER-P(READ12W)	ROLLER-P(READ12W)	2	
44	PF2252P933	FAN-2410ML-05W-B39	FAN-2410ML-05W-B39	2	HFAN
45	PF2254P141	MSWレバ`-N	MSW Lever N	2	
46	PF4051P025	GER-0.8-26	GER-0.8-26	3	
47	PF4051P034	GER-0.8-20	GER-0.8-20	2	
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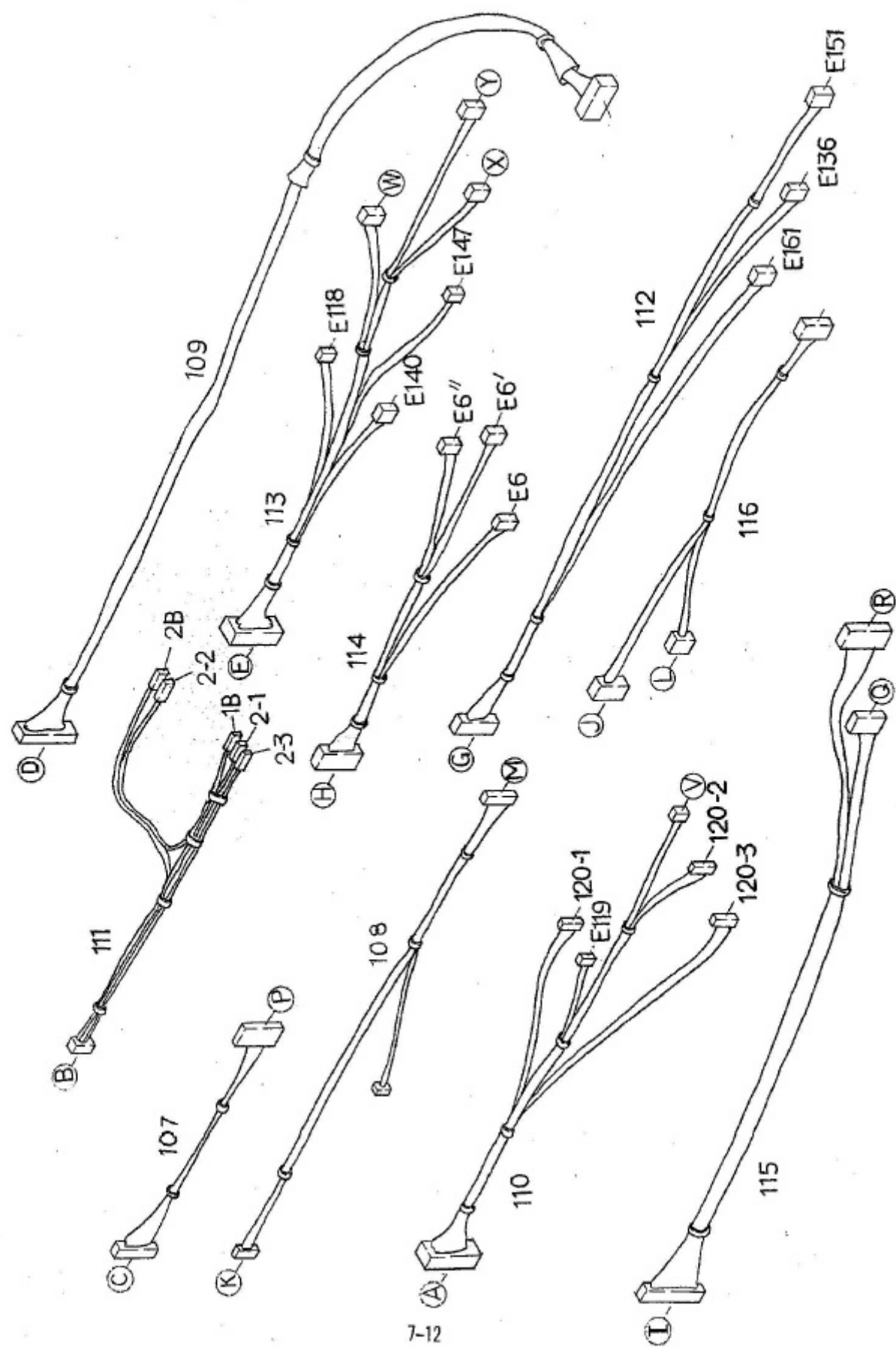
Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
51	PR5002P201	ボビン	Bobbin	1	
52	PR5002P204	リボンプーリー1	Ribbon Pulley	2	
53	PR5002P208	リボンチャック	Ribbon Catcher	1	
54	PR5002P225	テマワシローラー	Handle	1	
55	PR5002P236	リボンケースロック	Ribbon Case Rock	1	SP1
56	PR5002P237	リボンプーリー 2	Ribbon Pulley 2	2	SP1
57	PR5002P248	クロックディスク	Clock Disk	1	
58	PR5002P407	チャックハネ	Catcher Spring	4	
59	PR5002P414	リボンコロハネ	Ribbon Collar Spring	4	SP1
60	PR5002P416	BM0508FB	BM0508FB	4	SP1,SP2
61				1	
62		ニスカロコ	NISCA	1	
63	PR5002P555	ASM-NR1296-13132M	ASM-NR1296-13132M	1	
64	PR5005P201	ハンテンプレート	Turn Plate	1	
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71	PR5100K016	PBA-SENSOR	PBA-SENSOR	1	
72	PR5100K038	ASM-LD RELAY 2	ASM-LD RELAY 2	1	
73	PR5100P083	CASSETTE-LEVER-PLATE	CASSETTE-LEVER-PLATE	1	
74	PR5100P202	GER-0.8-50	GER-0.8-50	2	
75	PR5100P218	PLY,S2M-22-60	PLY,S2M-22-60	1	
76	PR5100P220	PLY,S2M-16-70	PLY,S2M-16-70	1	
77	PR5100P242	CASSETTE-LEVER	CASSETTE-LEVER	1	
78	PR5100P244	CL-CHACK	CL-CHACK	1	
79	PR5100P245	PUSH-ROLLER	PUSH-ROLLER	6	
80	PR5100P247	PLY,S2M-43-18	PLY,S2M-43-18	1	
81	PR5100P401	KNOB-FASTENER	KNOB-FASTENER	1	
82	PR5100P421	CL-BRUSH	CL-BRUSH	1	
83	PR5110P418	HEAD-LABEL-T	HEAD-LABEL-T	1	
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91	PR5200P226	PINCH-ROLLER	PINCH-ROLLER	6	
92	PR5200P410	PINCH-SPRING	PINCH-SPRING	8	
93	PR5300P481	FT-TEN-SP	FT-TEN-SP	1	
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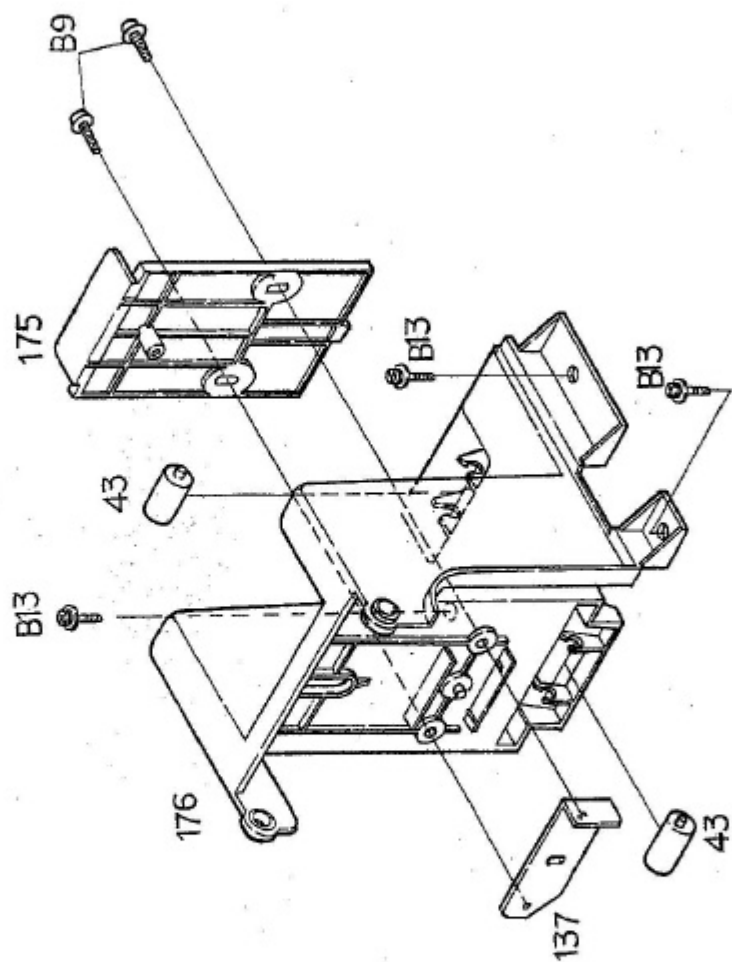
Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
101	PR5300K036	PBA-MAIN-SUB	PBA-MAIN-SUB	1	
102	PR5300K004	PBA-IF-SCSI	PBA-IF-SCSI	1	
102	PR5300K010	PBA-PIF	PBA-PIF	①	Distination
103	PR5300K008	PBA-OPEPANE	PBA-OPEPANE	1	
104	PR5300K011	ASM-AC1	ASM-AC1	1	
105	PR5300K012	ASM-AC2	ASM-AC2	1	
106	PR5300K013	ASM-FGND	ASM-FGND	1	
107	PR5300K014	ASM-DC	ASM-DC	1	
108	PR5300K015	ASM-POW-DC	ASM-POW-DC	1	
109	PR5300K016	ASM-HEAD	ASM-HEAD	1	
110	PR5300K017	ASM-MOTOR	ASM-MOTOR	1	
111	PR5300K018	ASM-I/L-SW	ASM-I/L-SW	1	
112	PR5300K019	ASM-SENSOR-A	ASM-SENSOR-A	1	
113	PR5300K020	ASM-SENSOR-B	ASM-SENSOR-B	1	
114	PR5300K021	ASM-SENSOR-C	ASM-SENSOR-C	1	
115	PR5300K023	ASM-OPERATION	ASM-OPERATION	1	
116	PR5300K024	ASM-IF-R/W	ASM-IF-R/W	1	
117	PR5300K027	PBA-リボンLD	PBA-Ribbon LD	1	SN10 (LED)
118	PR5300K028	PBA-リボンPT	PBA-Ribbon PT	1	SN10 (PT)
119	PR5300K029	MOT-DME37BF-102ｸﾐ	MOT-DME37BF-102ｸﾐ	1	DM1
120	PR5300K030	MOT-KH42JM2-UNIT	MOT-KH42JM2-UNIT	3	PM1,2,3
121	PR5300K031	ASM-SENSOR RELAY	ASM-SENSOR RELAY	1	
122	PR5300K101	FRONT-FRAME-ASSY	FRONT-FRAME-ASSY	1	
123	PR5300K102	REAR-FRAME-ASSY	REAR-FRAME-ASSY	1	
124	PR5300K104	PRT-TENSION-BKT-ASSY	PRT-TENSION-BKT-ASSY	1	
125	PR5300K106	RBN-GEAR-BKT-ASSY	RBN-GEAR-BKT-ASSY	1	
126	PR5300K107	SLIDE-BKT-ASSY	SLIDE-BKT-ASSY	1	
127	PR5300K111	FT-PICK-MOT-ASSY	FT-PICK-MOT-ASSY	1	
128	PR5300K113	FT-PLT-R-ASSY	FT-PLT-R-ASSY	1	
129	PR5300K115	FT-STM-MOT-ASSY	FT-STM-MOT-ASSY	1	
130	PR5300K155	HEAD-UNIT	HEAD-UNIT	1	
131	PR5300K156	RIBBON-CASSETTE-UNIT	RIBBON-CASSETTE-UNIT	1	SP1
132	PR5300K166	CL-UNIT	CL-UNIT	1	
133	PR5300K182	WEIGHT UNIT	WEIGHT UNIT	1	
134	PR5300P001	BASE-FRAME	BASE-FRAME	1	
135	PR5300P004	POWER-COVER	POWER-COVER	1	
136	PR5300P009	SUPPLY-STAY	SUPPLY-STAY	1	
137	PR5300P012	SEPARATE-LOCK	SEPARATE-LOCK	1	
138	PR5300P014	T-COV-PROTECT-BKT	T-COV-PROTECT-BKT	1	
139	PR5300P020	CL-SLIDE-GUIDE	CL-SLIDE-GUIDE	1	
140	PR5300P025	START-SEN-BKT	START-SEN-BKT	1	
141	PR5300P026	PRT-STM-BKT	PRT-STM-BKT	1	
142	PR5300P028	MOVE-GUIDE-BKT	MOVE-GUIDE-BKT	4	
143	PR5300P029	HEAD-FAN-BKT-1	HEAD-FAN-BKT-1	1	
144	PR5300P034	HEAD-PRESS-IN-BKT	HEAD-PRESS-IN-BKT	1	
145	PR5300P035	HEAD-PRESS-OUT-BKT	HEAD-PRESS-OUT-BKT	1	
146	PR5300P039	RBN-WIND-SEN-BKT	RBN-WIND-SEN-BKT	1	
147	PR5300P040	RBN-SENSOR-BKT-LOW	RBN-SENSOR-BKT-LOW	1	
148	PR5300P041	RBN-SENSOR-BKT-UP	RBN-SENSOR-BKT-UP	1	
149	PR5300P044	REJECT-GUIDE	REJECT-GUIDE	1	
150	PR5300P045	REJECT-UNIT-GUIDE	REJECT-UNIT-GUIDE	1	

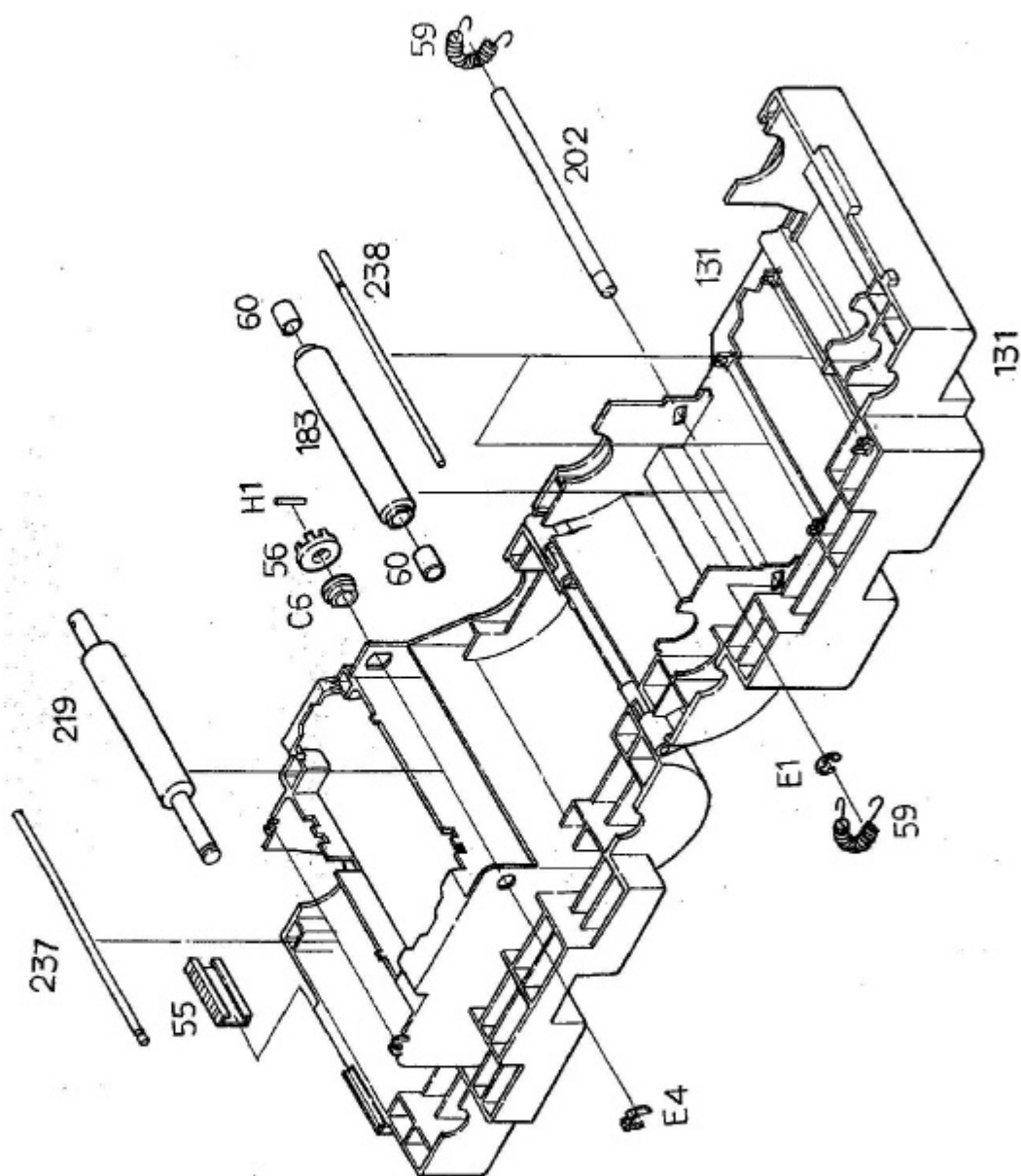
Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
151	PR5300P055	FT-FRAME-F	FT-FRAME-F	1	
152	PR5300P061	CAS-EARTH-PLATE	CAS-EARTH-PLATE	1	
153	PR5300P062	HEAD-HARNES-GUIDE	HEAD-HARNES-GUIDE	1	
154	PR5300P064	RBN-GEAR-INNER-BKT	RBN-GEAR-INNER-BKT	1	
155	PR5300P067	REJECT-GUIDE-2	REJECT-GUIDE-2	1	
156	PR5300P104	CL-JOINT-SUPPORT-BKT	CL-JOINT-SUPPORT-BKT	1	
157	PR5300P108	FT-TENSION-BKT	FT-TENSION-BKT	1	
158	PR5300P109	FT-PLT-STAY	FT-PLT-STAY	1	
159	PR5300P111	FT-SEN-BKT-1	FT-SEN-BKT-1	2	
160	PR5300P112	FT-SEN-BKT-2	FT-SEN-BKT-2	1	
161	PR5300P120	FT-POS-SEN-BKT	FT-POS-SEN-BKT	1	
162	PR5300P121	FT-WEIGHT-PLT	FT-WEIGHT-PLT	1	
163	PR5300P141	MAIN-SW-SUPPORT	MAIN-SW-SUPPORT	1	
164	PR5300P142	BOARD-BKT-SCSI	BOARD-BKT-SCSI	1	
	PR5300P153	BOARD-BKT-PALA	BOARD-BKT-PALA	①	Destination
165	PR5300P143	MAIN-BOARD-STAY	MAIN-BOARD-STAY	1	
166	PR5300P147	INT-LOCK-SW-BKT	INT-LOCK-SW-BKT	1	
167	PR5300P154	EXIT-HOOK-BKT	EXIT-HOOK-BKT	1	
168	PR5300P155	RBN-COV-INT-BKT	RBN-COV-INT-BKT	1	
169	PR5300P200	TOP-COVER	TOP-COVER	1	
170	PR5300P201	FRONT-COVER	FRONT-COVER	1	
171	PR5300P202	RIGHT-COVER	RIGHT-COVER	1	
172	PR5300P203	REAR-COVER	REAR-COVER	1	
173	PR5300P204	CARD-SET-COVER	CARD-SET-COVER	1	
174	PR5300P205	RIBBON-COVER	RIBBON-COVER	1	
175	PR5300P207	SEPARATE-GATE	SEPARATE-GATE	1	
176	PR5300P209	HOPPER	HOPPER	1	
177	PR5300P210	LEFT-COVER	LEFT-COVER	1	
178	PR5300P216	MAIN-SW-COVER	MAIN-SW-COVER	1	
179	PR5300P218	EXIT-BOX	EXIT-BOX	1	
180	PR5300P225	PINCH-GAP	PINCH-GAP	10	
181	PR5300K198	MOVE-GUIDE-PLT-UNIT	MOVE-GUIDE-PLT-UNIT	4	
182	PR5300P227	CARD-GUIDE	CARD-GUIDE	1	
183	PR5300P228	RIBBON-IDLE-ROLLER	RIBBON-IDLE-ROLLER	2	SP1,SP2
184	PR5300P231	PRESS-UNIT-GUIDE	PRESS-UNIT-GUIDE	2	
185	PR5300P232	HEAD-CAM	HEAD-CAM	2	
186	PR5300P233	CAM-POSITION-PLY	CAM-POSITION-PLY	1	
187	PR5300P242	GEAR-1.0-28	GEAR-1.0-28	1	
188	PR5300P243	GEAR-1.0-14-0.8-56	GEAR-1.0-14-0.8-56	1	
189	PR5300P272	RBN-COVER-SWITCH	RBN-COVER-SWITCH	1	
190	PR5300P273	OPEPANE-KEY	OPEPANE-KEY	1	
191	PR5300P274	OPERATION-PANEL	OPERATION-PANEL	1	
192	PR5300P275	T-COV-PROTECTOR	T-COV-PROTECTOR	1	
193	PR5300P283	FT-PLT-F	FT-PLT-F	1	
194	PR5300P285	FT-PINCH-ROLLER	FT-PINCH-ROLLER	6	
195	PR5300P286	FT-PST-PLY	FT-PST-PLY	1	
196	PR5300P288	GER-0.8-50-20	GER-0.8-50-20	1	
197	PR5300P289	PLY-S2M-56-G-40	PLY-S2M-56-G-40	1	
198	PR5300P290	PLY-S2M-20-G-0.8-50	PLY-S2M-20-G-0.8-50	1	
199	PR5300P293	HEAD-PST-ROLLER	HEAD-PST-ROLLER	2	
200	PR5300P310	CL-SHAFT	CL-SHAFT	1	

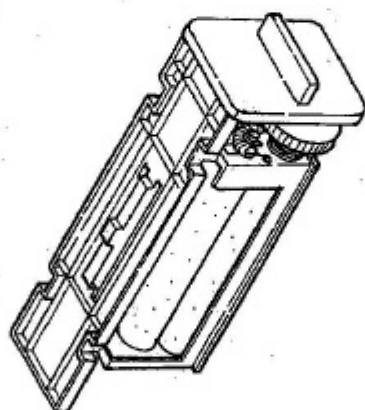
Ref.No.	Part No.	品 名	Part Name	Qty	Remarks
201	PR5300P315	PINCH-SHAFT	PINCH-SHAFT	3	
202	PR5300P318	RIBBON-PINCH-SHAFT	RIBBON-PINCH-SHAFT	2	SP1
203	PR5300P357	CAM-SHAFT-2	CAM-SHAFT-2	1	
204	PR5300P322	PUSH-ROLLER-SHAFT	PUSH-ROLLER-SHAFT	1	
205	PR5300P323	WIND-SHAFT	WIND-SHAFT	1	
206	PR5300P324	WIND-CONNECT-SHAFT	WIND-CONNECT-SHAFT	1	
207	PR5300P330	POSITION-ROL-SHAFT	POSITION-ROL-SHAFT	2	
208	PR5300P336	RBN-CAS-GUIDE	RBN-CAS-GUIDE	4	
210	PR5300P341	FT-WEIGHT-SHAFT	FT-WEIGHT-SHAFT	2	
211	PR5300P348	OW-SHAFT	OW-SHAFT	1	
212	PR5300P354	FT-TENSION-SHAFT	FT-TENSION-SHAFT	1	
213	PR5300P400	TM166-8	TM166-8	5	
214	PR5300P413	CAPSTAN-ROLLER-1	CAPSTAN-ROLLER-1	1	
215	PR5300P414	MOT-TENSION-SP	MOT-TENSION-SP	1	
216	PR5300P415	PLATEN-ROLLER	PLATEN-ROLLER	1	
217	PR5300P416	CAPSTAN-ROLLER-2	CAPSTAN-ROLLER-2	1	
218	PR5300P417	MOVE-GUIDE-SPRING	MOVE-GUIDE-SPRING	4	
219	PR5300P418	RIBBON-WIND-ROLLER	RIBBON-WIND-ROLLER	2	SP1
220	PR5300P419	GEAR-1.0-40-OW	GEAR-1.0-40-OW	1	
221	PR5300P420	HEAD-REMOVE-SP	HEAD-REMOVE-SP	2	
222	PR5300P421	HEAD-SPRING	HEAD-SPRING	2	
223	PR5300P436	GEAR-0.8-52-TL500	GEAR-0.8-52-TL500	2	
224	PR5300P423	OTLC-6-2000C	OTLC-6-2000C	1	
225	PR5300P428	PRT-FEED-ROLLER	PRT-FEED-ROLLER	1	
226	PR5300P429	OW-BUSH	OW-BUSH	2	
227	PR5300P430	SUPPLY-ROLLER	SUPPLY-ROLLER	1	
228	PR5300P431	FT-ROLLER	FT-ROLLER	2	
229	PR5300P442	OTLC6-1000B	OTLC6-1000B	1	
230	PR5300P455	HEAD-FAN-FILTER	HEAD-FAN-FILTER	1	
231	PR5300P456	PROTECT-SPRING	PROTECT-SPRING	1	
232	PR5300P457	RBN-COV-SPRING	RBN-COV-SPRING	1	
233	PR5300P458	LINE-SEAL	LINE-SEAL	1	
234	PR5300P459	C-96-2	C-96-2	1	
235	PR5300P480	HEAD-PST-SP	HEAD-PST-SP	1	
236	PR5300P552	PWS-RPS-9286	PWS-RPS-9286	1	
237	PR5300P355	RBN-GUIDE-SHAFT-UP	RBN-GUIDE-SHAFT-UP	1	
238	PR5300P050	BRAKE-BKT	BRAKE-BKT	1	
239	PR5300P338	BRAKE-SHAFT	BRAKE-SHAFT	1	
240	PR5300P156	MOVE-GUIDE-PLATE	MOVE-GUIDE-PLATE	4	
241	PR5300P444	OTLC6-150A	OTLC6-150A	1	
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